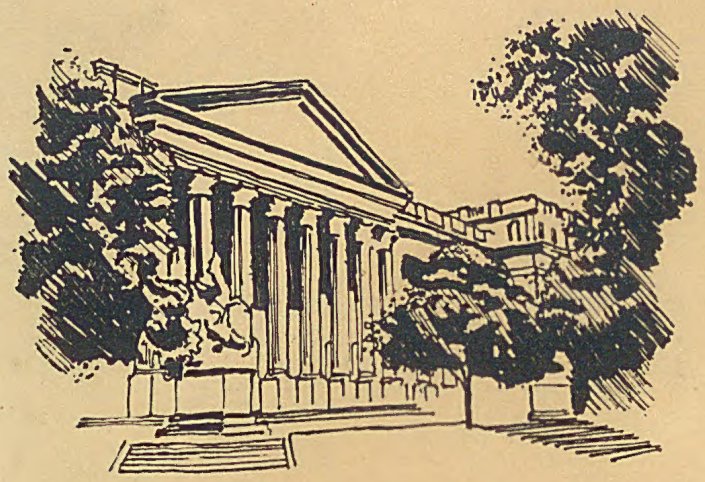
THE SCIENCE MUSEUM OF VICTORIA

a history of its first hundred years



Warren Perry

NATIONAL MUSEUM
29 MAY 1972
OF VICTORIA

MUSEUM OF VICTORIA
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THE SCIENCE MUSEUM OF VICTORIA

A History of its First Hundred Years

PLATE 1. His Honour Judge Samuel Henry Bindon. First Chairman of the Museum Committee.
(By courtesy National Library of Australia)

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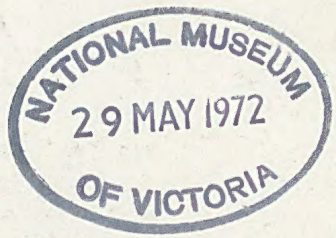
THE SCIENCE MUSEUM OF VICTORIA

A History of its First Hundred Years

By

WARREN PERRY

E.D., M.A. (Melb.), B.Ec. (Syd.)



MELBOURNE
SCIENCE MUSEUM OF VICTORIA
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1972

Dedicated to the Memory of

THE HON. SAMUEL HENRY BINDON

Judge of the County Court of Victoria, 1869-79
First Chairman of the Technological Commission of Victoria, 1869
Chairman of the Committee of the Industrial and Technological Museum
1870-79
Born at Limerick, Ireland, in 1812
Died at St. Kilda, Victoria, in 1879

His active and sustained interest
in the promotion of Technical Education in Victoria
did much to stimulate the development
of the colony's primary and secondary industries

Foreword

When Warren Perry accepted the commission to write this centenary book it was clear that he would have to bring together a composite picture of social conditions, political pressures, and scientific progress within the frame of a century. A chronological recital of sparsely minuted happenings would not have been good enough, yet the very nature of such a history required that it be not over-coloured with the tendentious commentaries of one man. Mr Perry accepted the challenge in the best traditions of the ardent and conscientious historian and he has produced a balanced and thorough work.

Anyone setting out to produce a literary alloy of social history and scientific endeavour must find the period 1870-1970 provides unparalleled source material. The progress in applied science through that century went hand in hand with changes in social conscience. The very wording of the 1869 Technological Commission's objectives was blatantly paternalistic and unashamedly class-conscious. Happily, that attitude became eroded to near-oblivion as the century neared its end, and today, in Australia, we have both the extensive establishment of degree-awarding colleges for technical education, and the recognition of museums of science and technology as worthy companions of their sister institutions of art and natural history.

Much has been said and written about progress in the applied sciences over the hundred years under review. It has followed an ever-steepening growth curve whose very nature has posed challenging problems for science museums, far greater than those faced by museums of art and natural history, whose problems, difficult enough in all conscience, are more concerned with new interpretations than with new discoveries on the grand scale. All the Victorian state museums, however, are dependent on parliamentary appropriations, through good times and bad times, and this, together with the administrative anomalies that hampered them up to 1945, has made serious problems for all the museum trustees. Just how effectively these have been faced over the years by successive trustees and directors of what is today the Science Museum, and by numerous supporters outside the administration, has been vividly set down by Warren Perry.

The Science Museum of Victoria
MELBOURNE,
1 April 1971.

J. A. L. Matheson
PRESIDENT

Preface

This book is the first major attempt to record the history of the activities of the Science Museum of Victoria. Australia's oldest museum of applied science,[1] it offers the public a wide range of interesting exhibits for inspection and study. They are intended not only to satisfy the curiosity of the casual visitor but also to stimulate the layman's interest in science and illustrate to more specialised observers their industrial significance and their commercial possibilities.

The Museum's history began literally in the horse and buggy age, and before the introduction of the telephone and the typewriter. Today, it operates in an age of motorised transport which has transformed the life of man throughout the world. Science and technology have banished horse-drawn vehicles to annual agricultural shows; they have reduced the travelling time between Melbourne and London from about two months by steamship in 1870 to less than two days by air in 1970, and they have already created problems of congestion and of pollution which threaten to outweigh all the advantages they have hitherto conferred on mankind.

In looking back over the Museum's one hundred years of history, two striking facts may be observed on the staff side. One is that for the first sixty-five years of this period the position of Director was occupied by James Cosmo Newbery and his successor, Richard Henry Walcott. But during the remaining thirty-five years the position has been occupied by four Directors. Three past Directors are happily still living and one of them attended the Centenary Dinner.

The book has two main objectives. The first is to appeal to the intelligent general reader. The second is to provide precise information for use by the Trustees and the staff of the Museum in current administration—information about the Museum's origin, its organisational and administrative development, its trials and its triumphs over the past hundred years. Due reference has perforce been made to the retarding influences on the Museum's development from time to time—inadequate space, insufficient staff and inadequate financial support.

Decisions had to be made early on what to include and to exclude from the narrative and on what form it was to be given. There were three possibilities. One was to organise

[1] *Official Year Book of the Commonwealth of Australia*, No 52, 1966, pp. 633-8.

the book into a number of chapters, each devoted to an historical treatment of one or more of the Museum's collections, such as aviation, biology, horology and minerals; the second was to deal with the administrative development of the Museum chronologically, to show changes in overall policy and its organisation, its administrative methods and problems, its system of finance, and its procedures for staff recruitment and training. The third possibility was a compromise between these two methods of approach and this was the one chosen.

Controversial subjects have not been ignored, and at times administrative methods have been criticised on grounds of inefficiency. The narrative's style—whether descriptive, critical or interpretive—also reflects a conscious concern with chronological exactitude. It has been said with truth that dates "are the bones of historical anatomy". General Monash, when commanding the Australian Corps on the Western Front in 1918, once said to his chief clerk: "Never bring me a document without a date on it or a map not marked with a north point". The strict observance, by makers of records, of Monash's two injunctions would certainly make life easier for administrators and historians. The style and form of the book also show that I am in agreement with Heinrich von Treitschke on the point that "Men make history". I do not share the fears of those who believe that histories of public institutions should not be "plentifully bespattered with the names of civil servants who served their country well."[2] In giving full expression to my attitude in this regard, however, I have met with obstacles. The official records of members of the staff for about the first seventy-five years of the Museum's history were, in so far as I was able to locate them, often incomplete, vague sometimes to the point of uselessness, and generally unsatisfying. It is only since the abandonment of the system of omnibus trustee administration, which prevailed before March 1945, that staff lists can be found to show the Museum's actual staff, at points of time, by numbers, names and positions. Despite these deficiencies I have tried to identify clearly each person mentioned in the text. In some instances, too, I have tried, in the manner of the film producer, to give a "close up" of persons when they are being introduced in the context in some major role such as that of a newly elected Chairman of Trustees or a newly appointed Director.

The book's unifying theme is the Museum's unending and often unsuccessful struggle, during the past hundred years, to gain more space, more staff and more money to provide for normal development. It would have been possible without falsification to have written, with the aid of those well-known literary instruments of compression and omission, a saga of the first hundred years which would have been a story of almost uninterrupted progress and success. But a panegyric of this kind was not what the Trustees wanted.

The information used in the writing of this book has been located, studied, extracted and organised single-handed—a method which has been both laborious and costly in time. The information has been gathered too from diverse sources as the bibliography and the footnotes indicate. The purpose of the footnotes is solely utilitarian; they are

[2] W. K. Hancock, *The History of Our Times*. (The Webb Memorial Lecture, 21 November 1950), the Athlone Press, London, 1951.

not intended to give the book a veneer of scholarship. They are to help practising administrators who, at every stage in their daily work, need to know the authority for this or that and where they can obtain fuller information if required.

Interviews, sometimes one of the more pleasant tasks of historians, have had to be severely curtailed for reasons of time. No private papers or diaries could be found of either James Cosmo Newbery or Richard Henry Walcott, but sufficient new material was discovered to make a further contribution to our knowledge of these two administrator-scientists.

Although decimal currency was introduced into Australia on 14 February 1966, I have not converted amounts in pounds, shillings and pence where they occur in the text before this date.

In the last stage of the writing of this book an Act was assented to in December 1970, which changed the institution's designation for the fourth time in a hundred years. By this, the name "Institute of Applied Science of Victoria" was changed to "Science Museum of Victoria". But the Act, and therefore this change in designation, did not come into force until 3 February 1971. This history ends with the closing of the centenary year of 1970, but it would have been unrealistic not to have taken cognizance here of this change.

Despite the care that has been taken in checking the narrative some errors and omissions probably remain. For these I accept responsibility and would be pleased to be told about them by any readers who may care to write to me. I am also solely responsible for any opinions expressed in this book.

Melbourne
15 March 1971

WARREN PERRY

Acknowledgements

Writing a book of this nature requires the assistance of a large number of people and not all of them can be mentioned here because of limitations of space. If any particular name is omitted, this certainly does not mean that the help given has not been appreciated.

First I must acknowledge my indebtedness to the Director of the Science Museum of Victoria, Mr R. H. Fowler. During his official lifetime on the Museum's staff it has developed and taken its present form; and his knowledge of its history in its widest sense is unrivalled. He made himself freely available, often in the course of other pressing work, to answer questions, clear up doubts and to discuss particular aspects of the work as it progressed as a whole. His advice has been salutary and it often rescued me from error. I am also indebted to the Deputy Director, Mr F. J. E. Kendall, for advice and assistance freely given at all stages. Without their constructive criticisms of my draft chapters, my task would have been not only more difficult but also more prolonged.

Mr J. C. Liddy, the Physicist, helped me with information on economic minerals and the application of physics in industry. I am indebted to Mr G. S. W. Bradbury, the Agricultural Scientist, for advice on agricultural subjects and for his assistance in locating sources of information in the Museum's library. My thanks are due too to Mr C. V. Finlay, the Industrial Science Officer, for his explanations of the engineering aspects of certain exhibits—explanations which he was often obliged to illuminate with Irish wit in order to make them intelligible to my lay mind. To the Photographer, Mr C. F. Tilson, I express my thanks for his advice and assistance in the selection and preparation of photographs with which to illustrate this book. I am also under a special obligation to the Museum's Administrative Officer, Mr N. R. Buckley, who has an administrative officer's two outstanding virtues—he always gave prompt service and, if he did not know the answer, he said "I will find out and let you know". To Mr G. T. Warren, the senior Education Officer attached to the Museum's staff, I am indebted for factual information on the development and current aims of the Education Service and for his patience in answering many questions. I was assisted too by Miss Rosabelle E. Gerlach who kept my typewriter in good running order and provided typing assistance in moments of desperation. Finally, I am also under a

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And last but not least, I have to thank the Chairman, Dr J. A. L. Matheson, and the Trustees for permitting me to carry out this task in my own way and without any interference whatever on their part.

For help and guidance I am also indebted to the State Librarian of Victoria, Mr K. A. R. Horn and his principal officers—the Principal Librarian of the State Library of Victoria, Mr T. A. Kealy; the Librarian-in-charge of the La Trobe Library, Miss Patricia Reynolds; and Mr H. W. Nunn of the State Archives Section and their staffs. In this connection I should like to express my thanks especially to Mr P. V. L. Garrett (Library) and Mr K. A. Patterson (Archives). On many occasions when I had abandoned all hope of finding particular answers they amazed and gratified me by producing them. I am likewise indebted to the Director of the National Museum of Victoria, Mr John McNally, to the Deputy Director, Mr E. D. Gill, and to the Librarian, Miss J. M. Shaw, for assistance generously given in searching for information. To Mrs M. J. Carragher of Kew, I am indebted for biographical information about her uncle, the late John Askew. I am obliged, too, to Mr Derek Baker of the P.M.G.'s Department at Royal Mail House in Melbourne for factual information about Victoria's early telegraphic system and for biographical information on Samuel Walker McGowan.

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I thank the Commissioners of the State Rivers and Water Supply Commission and Sir Ronald East, a former Chairman of that Commission, for permission to re-print the letter shown in Appendix G.

In conclusion I am grateful for the assistance given by the Municipio di Livorno of Italy, which produced a photocopy of James Cosmo Newbery's birth certificate, and by the Harvard University Archives which supplied promptly information from its records of Newbery as a student at that university.

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List of Abbreviations

H.M.S.O.	*Her Majesty's Stationery Office*
S.M.H.	*The Sydney Morning Herald*
V.G.G.	*Victoria Government Gazette*
V.H.M.	*The Victorian Historical Magazine*
V.P.D.	*Victorian Parliamentary Debates*
V.P.P.	*Victorian Parliamentary Papers*

Chapter 1

Why the Museum was Opened

A little more than a hundred years ago a need was felt in Victoria for an industrial museum to encourage the development of manufacturing in the colony by exhibiting samples of the goods produced with information about their price, quality and availability for marketing, to afford publicity for all new inventions of an industrially useful character, and to conduct educational programmes by means of public lectures and classes of instruction on scientific, industrial and art subjects which were directly related to the development of the colony's industrial resources.

In the latter half of the year 1870 such a museum was opened in Melbourne and it was designated the *Industrial and Technological Museum*—a name which it was to retain for more than seventy years. But the establishment of an institution of this kind, dependent on the authority of Parliament and the expenditure of public money is not the work of a moment. It is the culmination of a period of preparation. During this time discussions take place, planning is undertaken, and the coming into force of legislation is usually followed by the drawing up and approval of regulations made under the appropriate Acts. There are Acts for the organisation and administration of the Museum, for the appropriation and expenditure of public moneys to establish it physically, to recruit staff to administer and maintain it, and to purchase furniture, office equipment, display cases, and exhibits that are required to equip it.

What were the events which led up to the establishment of the Industrial and Technological Museum of Victoria and the placing of it under the administrative control of a board with the cumbersome title of "Trustees of the Public Library, Museums and National Gallery of Victoria"? These events may be said to have begun on 19 July 1853 when by proclamation the Lieutenant Governor-in-Council appointed the first Trustees of the Public Library,[1] to be followed by an official opening on 11 February 1856.[2] The National Museum came into being on 1 March 1854, housed in the old Assay Office in La Trobe Street.[3] The third associated event was the official opening of the Museum of Art, displaying sculpture only, on 24 May 1861, followed

[1] *V.G.G.* No. 42, 20 July 1853, p. 1022.
[2] C. A. McCallum, *The Public Library of Victoria, 1856-1956.* (published by the Trustees, 1956), p. 4.
[3] R. T. M. Pescott, *Collections of a Century: The History of the First Hundred Years of the National Museum of Victoria.* (National Museum of Victoria, Melbourne, 1954), p. 4.

by the opening of the first picture gallery on 24 December 1864. The Museum of Art, later to be called the National Gallery, was housed on the south side of the ground floor of the Public Library. At this time the National Museum had no administrative connection with the Public Library and its associated Museum of Art.

Then two years later an event occurred which acquired a later significance unconnected with its primary object. It was the opening on the 24 October 1866 of Melbourne's first Intercolonial Exhibition of Australasia. The Exhibition was held in wooden buildings which had been erected immediately to the rear of the Public Library on a site which is now occupied by the Library's main Reading Room.[4] The Exhibition closed on the 23 February 1867. Five days later the Commissioners of this Exhibition were advising exhibitors by letter that:

> As the time approaches for the Official Closing of the first Intercolonial Exhibition of Australasia, the Commissioners beg leave to tender their thanks to the Exhibitors for the liberality and zeal evinced by them towards the undertaking. While doing so, they also desire to draw their attention to the importance of establishing some substantial memorial of an enterprise which has not only far exceeded the expectations of its promoters, but has won the sympathy and approval of the surrounding colonies.
>
> With this in view it is proposed to ask the assistance of the present Exhibitors to form the nucleus of a collection of objects adapted to further the formation of a Museum.
>
> Without attempting to define the details of such an institution, it may be sufficient for the present to state that the South Kensington Museum, London, appears to embody these features of public instruction and usefulness which are worthy of imitation here. The offspring of the Great Exhibition of 1851, it is now the recognised medium of instruction in the Industrial Arts, and it is not too much to hope that our Intercolonial Exhibition of 1866 may be the means of forming an Australian Institution for educational purposes of a similar character to the parent establishment in London.
>
> In the formation of an Industrial Museum, the first thing to do is to obtain a sufficient collection of raw materials by which to illustrate the various processes of manufacture.

Three weeks later the Chief Secretary informed the Commissioners by letter, dated 22 March 1867, that they were empowered to hold the premises hitherto occupied by them "until a body be finally appointed for that purpose (i.e. the establishment of a museum) and also to take charge of any contributions or exhibits which may be presented for the ultimate use of the Museum".

In June 1867 the Governor-in-Council appointed a provisional committee for a proposed museum of industry and art, its duties being "to receive and take charge of any contribution or exhibits which may be presented for the proposed Museum of Industry and Art".[5] Then, about eighteen months later, in January 1869, a Technological Commission was appointed, under the chairmanship of the Hon. S. H. Bindon,

[4] For a fuller description of these buildings see *Official Record of the Intercolonial Exhibition of Australasia, Melbourne, 1866-67.* (published by authority of the Commissioners, 1867) p. xii.

[5] *V.G.G.*, No. 72, 2 July 1867, p. 1175.

for "the purpose of promoting technological and industrial instruction, by lectures and otherwise, among the working classes of Victoria".[6] This commission has been described by Stephen Murray-Smith as "the first government instrumentality devoted to technical education anywhere in Australia."[7]

The Commissioners recommended, in a submission dated 17 February 1869, the establishment of a "Technological and Industrial Museum". They supported this recommendation by saying: "We believe that an institution of this sort, devoted to industry and art, is essential, if it is expected that the mechanics or artisans here are to compete with those in England". They envisaged an institution where models of machinery, of new inventions and improvements, could be examined, where specifications of patents could be compared with the models of them, where samples of materials—mineral, vegetable and animal—used in manufactures could be arranged for permanent exhibition and continually employed in illustrating the details of such manufactures. The Commissioners believed that in this way the application of science to the material, to the processes, and to the machinery of manufacture would greatly contribute to industrial knowledge, and the increase of our producing and manufacturing power. Then, as an indication of their earnestness, they added: "We propose, so far as we are able, to collect samples and specimens for this purpose".

In submitting their report, so soon after their appointment, the Commissioners explained that they had merely offered an opinion on some of the industrial requirements of Victoria and that they had indicated the course of action which they proposed to follow. The Commission's objectives were to place at the disposal of the working classes some of the special educational aids which had been given to other classes in the colony—aids which were afforded to the working classes in Europe by public assistance and by the munificence of private persons. Then with confidence the Commissioners said that, without any expectations that they could effect all that was desirable, they hoped to begin work which enlightened statesmen and practical men united in believing was essential to England's manufacturing progress and which was yet more essential for the progress of manufacturing among the people of Victoria.[8]

Later that same year, on 29 December 1869, the Industrial and Technological Museum came into legal but not physical existence by the provisions of the Library, Museums, and National Gallery Act. But this Act had other provisions and conferred wider powers. It incorporated the Industrial and Technological Museum, the Public Library of Victoria, the National Museum of Victoria and the National Gallery of Victoria into one unified and centralised administrative unit under the direction and control of a common Board of Trustees presided over by Sir Redmond Barry. Internally these four bodies became known collectively as "The Institution". The Act also pro-

[6] *V.G.G.*, No. 5, 22 Jan. 1869, p. 107.

[7] C. Sanders (editor), *Technical Education for Development* (University of Western Australia Press, 1966), p. 11.

[8] Reports and Papers published by the Technological Commission, Victoria. Mason, Firth & McCutcheon, Melbourne, 1870, pp. 1-4.

vided that: for the Institution's administration there should be not less than fifteen trustees who were appointed for life; that the Trustees of the Public Library then in office were to be appointed to the new Board of Trustees; that the real and personal property of the Institution was vested in the Trustees; and that these Trustees were empowered to make rules and regulations for the Institution's management, provided such rules and regulations were approved by the Governor-in-Council.

The new Board's[9] first meeting took place in the Executive Council Chamber in Melbourne on 7 February 1870, under the chairmanship of the Hon. J. A. MacPherson, M.L.A. who was the Premier and Chief Secretary. At this meeting a committee of seven Trustees was appointed to draw up rules and regulations for the administration of the Institution. Under the chairmanship of the Hon. Sir John O'Shannassy the committee soon completed its task and its draft rules and regulations were adopted at a meeting of the Board on 4 March 1870. They made one important provision for the distribution of the trustees' duties. It was that "for the more convenient and effective performance of the duties imposed on the trustees" five sectional committees be formed. These were the Committee of the Industrial and Technological Museum, the Committee of the Public Library, the Committee of the National Museum and Scientific Collections, the Committee of the National Gallery of Victoria, and the Finance Committee. Each committee was to have the direction and control of the business of its section, subject to the approval of the Board of Trustees—which also had power to dissolve any committee and appoint another in its place.

At the Board's meeting on 1 April 1870 Sir Redmond Barry was unanimously elected President and the Hon. Archibald Michie became Vice-President. Prior to the incorporation, Sir Redmond Barry, although recognised as the principal trustee of the Public Library, and usually acting as chairman, always signed official correspondence and other papers merely as "One of the Trustees" of the Public Library.

Sir Redmond Barry[10] was the son of an Irish general officer of the British Army, and first it was intended that he should follow his father's profession. Instead, he was called to the Irish Bar in 1838 after having graduated in Arts at Dublin University, and in 1839 he migrated to Australia. He landed in Sydney but after spending a few weeks there he moved to Melbourne which was then a mere struggling village. In Melbourne, Barry became a practising lawyer. In 1851 he was appointed Solicitor General, and he became a puisne judge of the Supreme Court of Victoria in the following year. In 1860 he was made a Knight Bachelor.

His appearance was impressive, his manner both commanding and pompous, and it was said that his success at the Bar would have been greater if his manner had been

[9] The names of the original members of the Board of Trustees of the Public Library, Museums, and National Gallery of Victoria were announced in *V.G.G.* No. 10, 4 Feb. 1870, p. 225.

[10] The Hon. Sir Redmond Barry, K.C.M.G., B.A.(Dublin), M.A.(Melb), LL.D.(Melb). Born, 7 June 1813, at Ballyclough, County Cork, Ireland. Puisne Judge of the Supreme Court of Victoria from Jan. 1852 to Nov. 1880. First Chancellor of the University of Melbourne from 17 May 1853 to 23 Nov. 1880. Foundation President of the Board of Trustees of the Public Library, Museums and National Gallery of Victoria, from 1 April 1870 to 23 Nov. 1880. Died 23 Nov. 1880.

less formal and punctilious. He had a deep sense of honour and never spared himself in the performance of his duties; but although he did good work at the Bar and later on the Bench he was not regarded as either a brilliant or a profound lawyer. Barry took very little, if any, direct personal interest in the affairs of the Industrial and Technological Museum. It was the Library that attracted his attention strongly, absorbed his time and gave him his deepest interest as President of the Board of Trustees. It was said that "In the early years of the Library, Barry drafted most of the correspondence, and no order for books was sent without his personal inspection." It was his custom to visit the Library almost daily and he was usually present at the unpacking and sorting of the cases of books as they arrived from London. On summer mornings he would walk down to the Library from his home at Carlton Gardens. If a blind, carelessly pulled up and out of line, caught his eye, he would call out in no gentle voice to the nearest attendant: "Square the yards, Sir; square the yards." He was meticulous about the conduct of visitors in the Reading Room; and if he noticed an offender wearing his hat or dozing instead of reading he would personally speak to him or send an attendant to him to do so. Although fond of lecturing, he was not a good lecturer; his style was pedantic and verbose, and while his lectures usually gave abundant evidence of careful preparation they were generally neither inspiring nor interesting.

Barry died on 23 November 1880. Three years earlier, it had been resolved to erect, by public subscription, a statue in his honour; but the matter was not pressed energetically enough and so nothing was accomplished before he died. Seven years after his death, on 23 August 1887, the great bronze statue of him which now stands in front of the State Library of Victoria in Swanston Street was unveiled by the Governor of Victoria, Sir Henry Loch.

But to return to the Board of Trustees over which Barry presided from April 1870. The establishment of the Institution on a broader basis at that time enabled the Trustees to have certain appointments made. One was the appointment of the Industrial and Technological Museum's first sectional committee. Its original members were: the Hon. Samuel H. Bindon, Charles E. Bright, the Rev. Dr J. I. Bleasdale, the Hon. James Goodall Francis, the Hon. Sir James McCulloch and the Hon. John Alexander MacPherson.

The Committee's first meeting was held at 4 p.m. on Monday, 21 March 1870, in the Trustees' Room. Half an hour later it had been adjourned to Thursday, 24 March 1870, because a quorum was not present. At this adjourned meeting the Hon. Samuel Bindon was elected chairman and one of the meeting's two resolutions was: "That the Librarian visit the two gas companies and enquire at what rate per thousand they will undertake to light up the Public Library and Museums during the year 1870".

Another appointment of immediate concern to the Board of Trustees was that of Clerk to the Trustees. It was filled in June 1870 by Marcus Clarke; and a few months later his title was changed to that of Secretary to the Trustees. Today Marcus Clarke is remembered for achievements in another capacity, as a writer and as the author of that enduring work, *For the Term of His Natural Life*.

Who was this first chairman of the Committee of the Industrial and Technological Museum? The Hon. Samuel Bindon[11] had been a county court judge since April 1869. Born in 1812 at Limerick in Ireland, he arrived in Victoria in 1855 at the age of 43 years; and in 1864 he was elected to the Legislative Assembly of Victoria as an independent member for Castlemaine. In Parliament he supported the McCulloch Ministry and conducted himself with tact and caution. Although he was usually mild mannered and persuasive, he displayed in Parliament qualities of independence and radicalism. He had a strong urge to help the underprivileged; throughout his short parliamentary career he often attacked the upper or wealthy classes. Indeed, he argued that they should be directly taxed to pay for the protection of their property. Another of his most consistent convictions was that the colony needed to develop its agricultural resources.

At the time Bindon became the Museum's chairman he was recognised as one of the colony's foremost men in the movement for the promotion of technical education. But it was said that his merits had been both scantily and grudgingly recognised by an influential section of the Melbourne press. It was also said that: "Sir Redmond Barry has certainly lent the light of his countenance and the weight of his name to the foundation of a technological department in the Public Library; but for downright hard work and unwearying application commend us to his County Court brother".[12]

The great technological movement in England and Europe at this time made it necessary for the artisans of Victoria to have the same facilities for technical education available to them as the artisans of Great Britain, France and Prussia enjoyed. The Committee believed that this could be done by a threefold method—by the physical establishment of an Industrial and Technological Museum where processes of manufacture and industrial development might be practically observed and scientifically explained; by lectures on the application of science to industry, and by class instruction. These methods of procedure, the Committee pointed out, were in accordance with those found most effective in the training schools of Europe. However, the Committee experienced many difficulties in the primary stage of its undertaking. It had to obtain a building which would be suitable for the housing of the Museum and its staff; it had to recruit staff to organise and administer the Museum and carry out its educational programme; it had to obtain specimens and build them up into scientifically classified and arranged collections; and then place these collections on exhibition in order to use them as teaching aids in the educational programmes it was to undertake.

The Great Hall of the Intercolonial Exhibition of 1866-7 was made available to accommodate the Museum. Standing on the site of the present main Reading Room of the State Library of Victoria, it provided the Museum authorities with accommodation quickly even if it was not wholly suitable.

[11] His Honour Judge Samuel Henry Bindon, LL.B.(Dublin). Chairman of the Sectional Committee of the Industrial and Technological Museum 1870-9. Died 1 Aug. 1879.

[12] *The Ballarat Courier* (leader), 11 April 1872.

Another urgent problem was the selection and appointment of a Director[13] to administer the Museum on behalf of the Board of Trustees and the Committee of the Museum. Parliament had voted a sum of £350 per annum for the salary of a Director and, on the Committee's recommendation, James Cosmo Newbery was appointed to the position and the Chief Secretary was asked in the following letter that Newbery's salary be paid on and from the 25 June 1870.

PUBLIC LIBRARY, MUSEUMS AND NATIONAL GALLERY OF VICTORIA

27 July 1870

Sir,

I have the honour to inform you that at a meeting of the Trustees held on the 24th June Mr Cosmo Newbery was appointed Scientific Superintendent of the Industrial and Technological Museum at a salary of £350 per annum, as provided for on the Estimates and to request that you will issue the necessary authority for the payment of such salary in the usual way, dating with payment from the 25th June 1870.

I have the honour to be,
Sir
Your obedient Servant,

Marcus Clarke
CLERK TO THE TRUSTEES

Newbery was a graduate in science of Harvard University and a chemist by profession.[14] After having graduated he went to England where he did postgraduate work at the School of Mines in Jermyn Street, London. Later he came to Australia. In 1865 he was appointed to the Department of Mines of Victoria as an analyst and assayer of the Geological Survey of Victoria. In his report of March 1866, the Director of the Geological and Mining Survey, Dr A. R. C. Selwyn (1824-1902), said:

> In the laboratory I have been fortunate in securing the valuable services of Mr J. Cosmo Newbery, in place of Mr Wood, whose death was reported last year. Mr Newbery arrived in Melbourne in June 1865. Before his departure from England, he was engaged in Dr Percy's laboratory in Jermyn Street and previously held the post of chemical assistant to Professor Cooke of Harvard College, United States. He holds the highest testimonials and recommendations from both these eminent men.

But Newbery's position in the Department of Mines was abolished in 1869 and he was obliged to look elsewhere for employment. It was in these circumstances that the Industrial and Technological Museum obtained his services.

[13] Although the title "Director" is used here for convenience the official title of the appointment was "Scientific Superintendent."

[14] James Cosmo Newbery, C.M.G., B.Sc.(Harvard). Born 28 June 1843 at Livorno (Leghorn), Italy. Scientific Superintendent of the Industrial and Technological Museum from 25 June 1870 to 1 May 1895. Died 1 May 1895 at St. Kilda, Victoria.

Soon after Newbery took up duty at the Museum, Professor Sir Frederick McCoy, who held the Chair of Natural Science in the University of Melbourne, spoke of him in the following glowing terms:

> He is one of the rising school of American chemists,[15] who with the utmost skill and careful accuracy of the scientific details of every chemical work they take in hand, have departed from the common practice, and benefited the world so much by specially devoting themselves to the useful applications of the science to the practical purposes of life, rather than consulting their own scientific fame by labouring at more theoretical researches, or rare combinations of no immediate use to mankind.

Professor McCoy went on to say of Newbery that:

> From my own personal knowledge, and from having often discussed his analyses with him, I may confidently say there are none of the younger chemists of the day the results of whose chemical investigations could be received with more complete confidence than his, not only from the skill and exhaustive care with which every substance in a compound is sought for, but for the singular precision of his quantitative determinations.[16]

Newbery's subsequent performance in the service of the Industrial and Technological Museum measured up well with these early eulogies.

Newbery was responsible for the direction and control of the Museum's administration;[17] he controlled the Museum's collections and their arrangement, he supervised the chemical laboratories and he discharged the duties of instructor in chemistry and metallurgy at the Museum; he had to keep the Museum's administrative records and to submit monthly to the Committee a progress report and a return of students studying at the Museum. His office hours were from 10 a.m. to 4 p.m., except Saturdays when they were from 10 a.m. to 12 noon.[18] By the terms of his employment, Newbery was allowed the right of private practice and he seems to have exercised this right extensively.

Newbery was fortunate in the position of Director in having George Henry Frederick Ulrich as a member of his professional staff. Ulrich was appointed to the Museum's staff at the same time as Newbery as the following letter to him shows:

PUBLIC LIBRARY, MUSEUMS AND NATIONAL GALLERY OF VICTORIA

25 June 1870

Sir,

I have the honour by direction of the Trustees of the Public Library, Museums and National Gallery of Victoria, to inform you that at a meeting of that body held on the 24th inst., you were appointed to the office of Geologist, to take charge

[15] This remark suggests that Newbery was a citizen of the U.S.A. It has not been possible to ascertain his nationality at birth.

[16] *Lectures delivered during the Spring Session of 1870*, with an Introduction by the Secretary to the Trustees, Marcus Clarke (Industrial and Technological Museum, Melbourne, 1871), p. 7.

[17] See Appendix E for the text of a "Memorandum on the duties of the Scientific Superintendent of the Technological Museum. Submitted by J. Cosmo Newbery" (undated).

[18] *Rules and Regulations of the Industrial and Technological Museum*, 1871.

of the Geological Department of the Museums and to deliver lectures illustrating that department over which you preside.

A meeting of the Technological and National Museums Committees will be held on Tuesday next the 28th inst. at 3 p.m., in the Trustees room at the Library, at which I am desired to request your attendance.

I have the honour to be,
Sir
Your obedient Servant

Marcus Clarke
CLERK TO THE TRUSTEES

Ulrich[19] was in fact appointed to the dual position of Curator of the Museum's mineral collections and Lecturer in Mineralogy although the extant records connected with his appointment do not set out in precise terms the title of his appointment, its salary, or its duties.

Ulrich was a Hanoverian, born at Zellerfeld in Upper Harz, and he was educated in Clausthal. There he attended at first the Royal Gymnasium and later the Royal School of Mines. Then he obtained employment in the Prussian Department of Mines and worked there for four years. Ulrich arrived in Melbourne in August 1853. For the next three or four years he followed the nomadic occupation of a gold digger, working at Forest Creek, Daisy Hill, and Bendigo; and he suffered all the vicissitudes of that hazardous and uncertain occupation. He returned to Melbourne in 1857 and was appointed an assistant secretary and draughtsman in the Mining Commission (the chairman of which was Professor McCoy). In 1858 the staff of the Geological Survey Branch was being increased and he obtained an appointment in it as a Field Geologist. He was promoted to the position of Senior Field Geologist in 1864. In 1867-8 he was on leave in Europe, where he made a study of the metallurgical methods in use at Chemnitz. After the Geological Survey Branch's disbandment it seems he became a Lecturer in Mining at the University of Melbourne before he became Curator of the Mineralogical Collections of the Industrial and Technological Museum. In this position at the Museum, Ulrich classified, arranged and named the valuable mineral collections which the Geological Survey Branch had deposited with it.

Professor McCoy knew Ulrich as well as he had known Newbery, and he described him, at this time, as "a gentleman well-known for many years in the colony as one of our most valued scientific observers". He also said of him that:

> On his arrival (in the colony) I had the pleasure of securing his aid for the Goldfields' Commission; then, having shown his powers, he became one of the most distinguished of the officers of the Victorian Geological Survey . . . He is, to my knowledge, a most accomplished mineralogist, having, so far as I know, no equal in this branch of the subject in the country, and fully able to impart instruction of the highest kind in this department.

[19] George Henry Frederick Ulrich, F.G.S. Born 1830. Curator of the Mineral Collections and Lecturer in Mineralogy in the Industrial and Technological Museum of Victoria, 1870-8. Professor of Mining and Mineralogy in the University of Otago, 1878-1900. Died 22 May 1900, near Point Chalmers, New Zealand.

Of Ulrich's qualifications as a lecturer in mining, McCoy added:

> and here I need only say that he has himself gone through the complete systematic course of instruction in one of the most famous mining schools in Europe, that of the Harz.[20]

After his appointment, Newbery began to organise and develop the Museum on a scientific as well as an industrial basis without delay. He purchased specimens of minerals and industrial products for exhibition and he arranged scientifically the donations which the Museum received. The rotunda was fitted up as a lecture room; and temporary laboratories were established in the old police sheds at the rear of the building.

The nucleus of the Museum's industrial collections was already to hand of course. These collections had come from the exhibits of the Intercolonial Exhibition of 1866-67 in Melbourne and had been donated by the exhibitors. The National Museum of Victoria also helped. It transferred a large number of models, an extensive collection of mineral specimens and a variety of samples of raw and manufactured materials. These various donations alone nearly filled the Great Hall in which they were to be displayed when the Museum opened. Many of the Museum's treasures were temporarily absent, at this time, at the Intercolonial Exhibition of 1870 at Prince Alfred Park in Sydney. This Exhibition, which was to commemorate the centenary of Captain Cook's landing in Australia, opened on 30 August and closed on 30 September.

The Museum's collections were organised on the same principles as those of the Museum of Irish Industry in Dublin and the Industrial Museum in Edinburgh. There were four main sections plus a miscellaneous section. The Geological Section comprised specimens from all parts of the world; the Zoological Section was for animal products and their industrial uses; the Phytological Section dealt with processed vegetable products; and the fourth section, the Machinery Section, was for machinery and models of inventions.[21]

Prominence was given to local manufactures and to displays of pottery and glassware. In order to exploit opportunities to advance local industry, Newbery visited several factories in Melbourne and its suburbs to acquaint himself with trends in development, the availability of products, and to grasp any opportunities which presented themselves to increase the Museum's collection in this way.

The Museum's original committee expressed the opinion[22] that specimens of firearms of all nations should be exhibited, in order that Victoria's mechanics and gunsmiths could examine the principles of their construction, and assess the utility of the various improvements introduced into the manufacturing of weapons of war. A collection was accordingly made and exhibited. Today it is one of the Institute's oldest collections and still attracts the professional interest of manufacturers and the armed

[20] *Lectures delivered during the Spring Session of 1870.* Industrial and Technological Museum, Melbourne, 1871, p. 9.
[21] Trustees Annual Report, 1870-1, p. 81.
[22] Trustees Annual Report, 1870-1, p. 82.

forces as well as that of laymen who visit the Institute. But of course during the hundred years that have passed this collection, as an exhibit, has been radically changed in character from time to time in two ways; by the addition of new weapons to indicate developments in manufacture and performance and by "weeding" out obsolete weapons which have ceased to have any importance as exhibits.

The Trustees presumably agreed with Shakespeare who said that ceremony was devised "To set a gloss on faint deeds, hollow welcomes", for when the time came to formally declare the Industrial and Technological Museum open to the public they dispensed with the ceremonial that one normally associates with an event of this kind. The formal opening took place on Thursday evening, 8 September 1870. In *The Age* of that morning it was announced in a paid advertisement in the "Public Notices" column that the Museum would be opened that evening at 7 p.m.; that commencing at 8 p.m. Professor McCoy[23] would deliver an inaugural lecture entitled "On the Methods of Diffusing Technological Knowledge";[24] that free tickets could be obtained on application to any Trustee or to the Secretary to the Board of Trustees, Marcus Clarke; and that persons who did not have tickets would be admitted at the doors on payment of sixpence.

Professor McCoy's inaugural lecture was conducted under the chairmanship of the President of the Board of Trustees, Sir Redmond Barry. It was held in that portion of the Museum then known as "The Rotunda"; there were approximately two hundred persons present, including about a dozen women. The chairman, in introducing Professor McCoy, took the opportunity of pointing out to the audience the importance of technical education and the benefits it conferred. He also explained that the lectures to be delivered at the Museum were intended to be of an instructive character, each one leading on to explain what the next in the series would develop; and that the lectures would be specially addressed to practical working men.[25]

With the delivery of Professor McCoy's inaugural lecture, the Museum was launched to discharge its functions. Thereafter it was opened to the public daily, except Sundays, from 10 a.m. till 4 p.m. This late opening and early closing soon provoked adverse criticism on the grounds that although the Museum existed to benefit the industrial and artisan classes it was opened only when they were at work and could not therefore visit it or profit by the educational classes which it conducted. More will be heard on this question later.

[23] Professor Sir Frederick McCoy, K.C.M.G., M.A.(Melb.), Hon. D.Sc.(Cantab), F.R.S. Born, probably in 1817, at Dublin. Professor of Natural Science in the University of Melbourne from 1854 to 1899. Died 13 May 1899.

[24] For the text of this lecture see *Lectures delivered in the Museum during the Spring Session of 1870.* pp. 1-14.

[25] A table, "Statistics of Lectures", will be found in the "Report of the Committee of the Industrial and Technological Museum to the Trustees . . . for the year 1870-71", p. 85. It gives titles of lectures, names of lecturers, dates given, attendances, and "amounts received", which are presumably for sales of admission tickets.

NATIONAL MUSEUM OF VICTORIA

Chapter 2

Early Years of Development (1870-84)

Soon after the Museum's official opening, Mr Ulrich conducted a course of instruction on geology and mineral deposits. These classes were held on Monday and Tuesday afternoons from 4.15 p.m. to 5.30 p.m.; the course began on 3 October and it ended on 16 December. Unfortunately, only six students enrolled. The attendance could probably have been increased if the classes had been conducted in the evenings as most of the people for whom these lectures were designed to reach would have been busily engaged in their normal occupations during the late afternoons.

Class lectures in chemistry were delivered by the Director on Tuesday evenings at 8 p.m. during the same period and they were attended by twelve students. Laboratories for instruction in analytical chemistry and in assaying were also open daily from 10 a.m. to 3 p.m. during the same period and they were attended by six students.

The persons attending these courses were, without exception, engaged during the day-time in a variety of occupations which made it necessary for the classes to be held in the evenings if the best attendances were to be obtained. The attendance at the laboratories was irregular and this was because they were available to students only during their normal working hours.

The series of formal lectures for the remainder of the year 1870 indicate their educational scope and the names of the lecturers indicate their authoritativeness. They were: G. Foord, "Chemistry applied to Manufactures"; Professor Halford, "Circulation of the Blood"; G. Foord, "Chemistry applied to Agriculture"; Professor Wilson, "The Conservation of Energy"; G. Foord, "Chemistry of the Sea"; R. L. J. Ellery, "Common uses of Astronomy"; G. Foord, "Chemistry of the Atmosphere"; Dr von Mueller, "Application of Phytology to the Industrial Purposes of Life"; G. Foord, "Preservation of Food"; and G. Foord, "Household Chemistry".

The Museum continued its lecture programmes and the Committee expressed a hope that it would be able to establish classes in mathematics, mechanics, chemistry, mineralogy and metallurgy, mechanical drawing, modelling and model-making and telegraphy. By 1873 the Museum's classes were organised into three schools—the School of Chemistry and Mineralogy, the School of Mathematics and Practical Geometry, and the School of Telegraphy. The lecturers were J. Cosmo Newbery in Practical Chemistry, G. H. F. Uhlrich in Mineralogy and Mining, and F. J. Pirani in

Chief Secretary's Office
Melbourne 7th March 1887

No 592

Gentlemen

I have the honour by desire of the Chief Secretary to inform the Commissioners of the Intercolonial Exhibition that they are empowered to hold the premises hitherto occupied by them until a body be finally appointed for that purpose and also to take charge of any contributions or exhibits which may be presented for the ultimate use of the Museum

I have the honour to be

Gentlemen

Your obedient servant

J. Moore

The Commissioners
Intercolonial Exhibition

PLATE 2. Chief Secretary's letter of authorization.

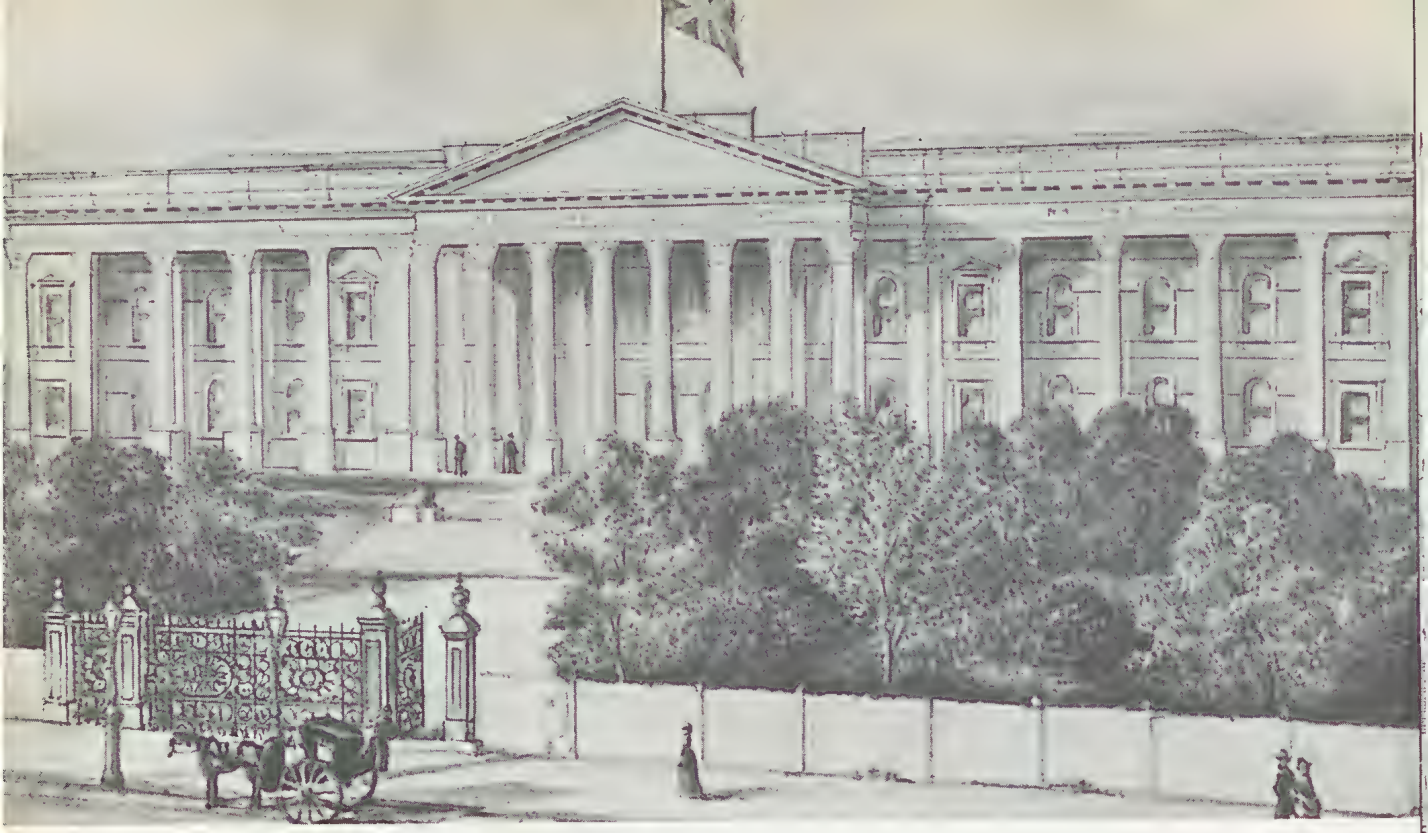


PLATE 3. The Museum frontage, Swanston Street, 1875.

PLATE 4. The Museum frontage, Swanston Street, 1968.

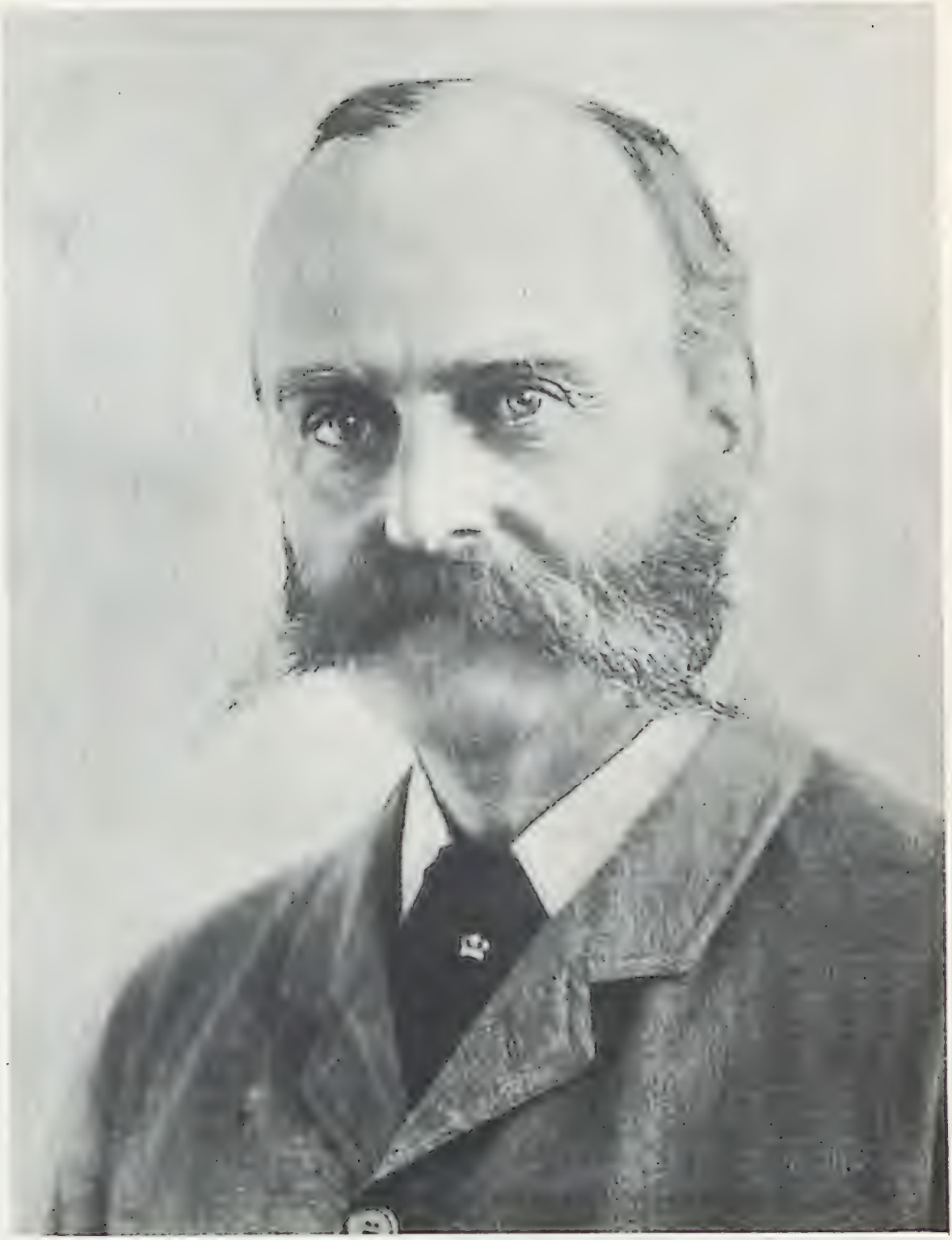


PLATE 5. James Cosmo Newbery. Scientific Superintendent of the Museum 1870-95.

25 with
41 Collins Street west 36
Melbourne 1st June 1870
read 27th Jan 1870

To His Honour Sir Redmond Barry
President of Trustees of Public Library and Museums
&c &c &c

Sir

I have the honour to apply for the appointment of Scientific Superintendent of the Technological Museum.

My qualifications for the post are, a knowledge of Chemistry in its various branches, and of mineralogy, geology and metallurgy.

I have made myself acquainted with such manufactures as glass, paper, soap, chemicals, pottery and leather, by repeated experiments in the manufactories and have sufficient knowledge of machinery to arrange and superintend that required to illustrate these and other manufactures.

I was for three years a student at Harvard University Cambridge United States where I obtained the degree of bachelor of Science and acted for some time as assistant to J. P. Cooke the professor of Chemistry and Mineralogy of that University.

I also hold certificates from the Royal School of Mines London for proficiency in Metallurgy and assaying. From that school I was appointed, on the recommendations of Dr Percy, analyst to the Geological survey of Victoria, which post I held till the ~~Geological~~ department was abolished in 1868 by the government. Since that time I have followed my profession as an analytical chemist and metallurgist in Melbourne, and have been entrusted with all the analyses required by the government Mining department.

If necessary I will forward my certificates for your inspection. As to my ability to fill the appointment of Scientific Superintendent of the Technological Museum I am permitted to refer you to Professor McCoy, Mr Ellery, Mr Brough Smyth, Mr Ulrich, Mr George Ford of the Royal Mint and Mr Johnson the government Analyst.

I have the honour to &c
Sir
Your Obedient Servant
J Cosmo Newbery

PLATE 6. Newbery's application for the position of Scientific Superintendent, 1 June 1870.

PLATE 7. The Intercolonial Exhibition of 1866-7 in the Great Hall which later housed the Museum.

PLATE 8. Top left.
George Henry Frederick Ulrich.
Curator of the mineral collection 1870-78.

PLATE 9. Top right.
Charles Walter.
Sometime economic botanist of the Museum.

PLATE 10. Lower left.
William Dickinson Wilson.
Economic botanist of the Museum 1915-32.

PLATE 11. Telegraphy class at the Museum, June 1872.

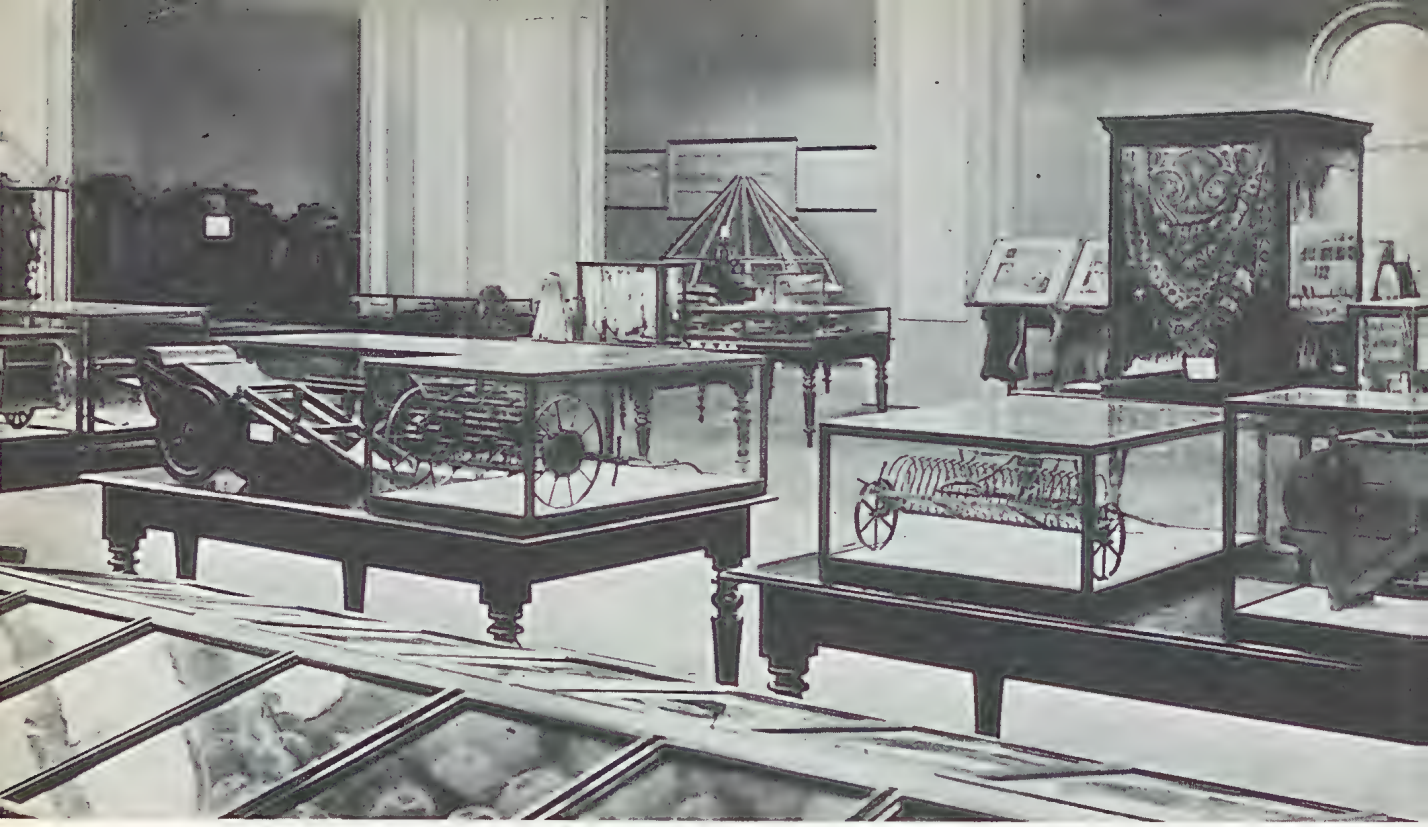
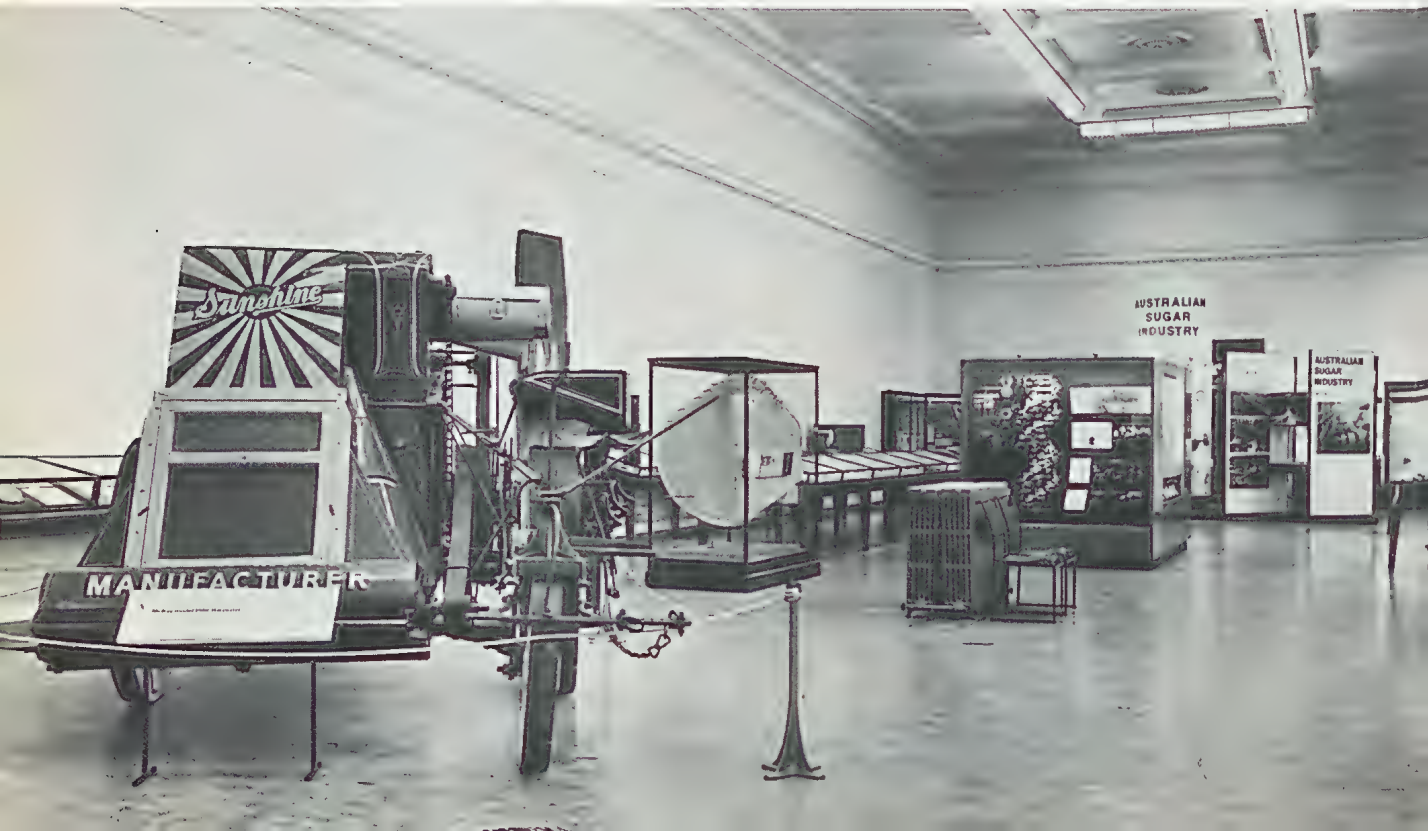


PLATE 12. Agricultural gallery, circa 1875.

PLATE 13. Agricultural gallery, 1970.



Mathematics, Practical Geometry and Mechanics. In addition Thomas Gay was the Instructor in Telegraphy, and E. F. Pitman was an Assistant Instructor in Practical Chemistry.[1]

W. C. Kernot[2] delivered a public lecture at the Museum on the 28 September 1871 on a subject which is old but always new. He named it "The Education of Engineers".[3] Today this lecture is of importance to those engineering historians who are concerned with the development of professional training. In his introductory remarks Kernot said: "I shall go into the matter as simply as possible, pointing out some of the more prominent evils in our present system of educating engineers, and suggesting means for their removal". Later he said: "In fact, there is hardly any object, any commodity, anything we use, which does not in some way render us dependent upon the engineer; and this being so, it is clear that the importance of the profession is great indeed". Kernot then outlined, with much critical commentary, a course of theoretical and practical training for pupil engineers. He stressed throughout the lecture the necessity for theory and practice to go hand in hand in a course of training and he concluded by saying:

> To sum up, then—theory and practice are the two pillars upon which all sound engineering work must be based. A man understanding theory, but deficient in practice, may have good general ideas, but will utterly fail in putting them into execution. A man of experience, but destitute of theory, will be able to carry out ordinary work in a satisfactory manner, but should he leave the beaten track and attempt anything original, will assuredly fall into the grossest blunders for lack of scientific training. Those who have been well instructed in both branches will become intelligent and scientific engineers, while others will, to the extent to which they are defective, be professionally crippled.

The Museum's progress during the year 1871 was satisfactory. The number of visitors had increased considerably, especially the number of those who for practical purposes desired to examine the various exhibits. The Committee reported that: "Considering the short space of time which has elapsed since the opening of the Museum, on 8 September 1870, the advanced position which it now occupies, and the interest which it has awakened, we are enabled to hope that the Museum will, in time, be creditable to the country and profitable to its industries".

Nevertheless, the hours during which the public could visit the Museum still caused inconvenience and adverse comment. *The Argus* felt obliged to say in a leader[4] that: "The Museum at the present time is practically closed against the industrial classes, and we should know who is to blame for this exclusiveness. Is it a question of funds? Have the Trustees applied to the Government for a grant to cover the extra cost of opening the place at night, and been refused, or do they consider such a course inexpedient?"

[1] See Appendix F.

[2] Later Professor William Charles Kernot, M.A., M.C.E., M.Inst.C.E. Born 16 June 1845. Foundation Professor of Engineering in the University of Melbourne, 1882-1909. Died 14 March 1909.

[3] *Lectures delivered during the Second Session of 1871*, pp. 28-44.

[4] 21 August 1871, p. 5.

A question which came up early in the Museum's history, and one which was to recur from time to time over a number of decades before it was solved, was "Should or should not the Museum open on Sundays?" Those who favoured Sunday openings had a strong and tactically well-placed advocate in Judge Bindon who was the chairman of the Museum's committee. In April 1871 he moved, at a meeting of the Board of Trustees, that the Museum be opened to the public on Sundays from 2 p.m. to 5 p.m. But consideration of the matter was postponed from time to time and no definite action was taken by the Trustees at that stage. Other trustees were to take up this matter after Judge Bindon's death eight years later.

One of the Museum's most popular courses of instruction was that in electric telegraphy. This means of communication had made a tremendous impact, during the previous twenty years, not only in Victoria but also throughout the rest of the world.

Samuel Walker McGowan had erected Australia's first electric telegraph line only ten years after the first Morse telegraph line was opened on 24 May 1844 in the U.S.A., between Baltimore and Washington. McGowan arrived in Melbourne early in 1853 with the express intention of forming a private company to build and operate telegraph lines within Australia, no such lines then existing in the country. But before he was able to begin the execution of this plan the government of Victoria decided to make the colony's telegraph services a public enterprise. It therefore called for tenders for the erection of Australia's first telegraph line to link Melbourne and Williamstown and McGowan's tender was accepted for the work. He began construction in November 1853 and the line was officially opened for traffic on 3 March 1854, in the presence of Lieutenant Governor La Trobe, at the Telegraph Office in William Street, Melbourne.[5]

Two days before this opening, on 1 March 1854, McGowan was appointed to the public service in the position of Victoria's first Superintendent of Telegraphs—a position which made him the permanent head of the newly created Telegraph Department.[6] The next line to be opened in Victoria was that between Melbourne and Geelong on 5 December 1854.

Inter-colonial telegraph communication came in due course. Communication was opened between Melbourne and Adelaide on 19 July 1858, between Melbourne and Sydney on 26 October 1858, and between Victoria and Tasmania, by submarine cable, on 30 September 1859. But owing to subsequent failures a regular service between Victoria and Tasmania did not begin until 1 May 1869.

By 1870 England was linked, by way of the Mediterranean and Aden, to India; and a year later the service was extended to Singapore and Batavia. A cable link between Java and Port Darwin was completed on 16 November 1871, and four days later the first message was transmitted between Port Darwin and Banjoewangie. But it was not until the following year, on 22 August 1872, that the Overland Telegraph line

[5] This line was free to users from the 3 March 1854 to 1 May 1854 because of the lack of legislation to authorise the government to make a charge.

[6] *The Argus*, 19 April 1887, p. 6.

between Port Augusta and Port Darwin was completed by joining the lines coming from the south and from the north at Frew's Ponds.[7] This enabled the Australian colonies to communicate, telegraphically, for the first time with overseas countries. The first cable message from England was received in Melbourne on 2 July 1872.[8] After a few false starts the cable service to overseas countries opened for regular service on 22 October 1872 when, according to Sir Charles Todd of South Australia: "The Australian colonies were connected with the grand electric chain which unites all the nations of the earth". Communication between Australia and New Zealand was established, by submarine cable on 20 February 1876.[9] The cable terminals were located at La Perouse in Sydney and at Wakapuaka in New Zealand.

This rapid expansion in a new and exciting means of communication created a demand for trained telegraphic operators in Victoria. Initially, the sole place for class training in telegraphy was the Museum. Its first class of two hours duration began on Tuesday evening, 26 March 1872, in the Museum's lecture theatre. Each student paid a fee of £1 for a course of two lessons weekly for eight weeks and the daily use of the theatre and equipment for practice.[10] The classes were conducted by Thomas Gay of the Post Office and Telegraph Department of Victoria; they were well attended mainly by women, and the applications often exceeded the number that could be accepted. Those students who completed the course satisfactorily were given certificates of competence.[11]

The examiners were: R. L. J. Ellery who was the Government Astronomer of Victoria, and S. W. McGowan,[12] a senior officer of the Post Office and Telegraphic Department of Victoria,[13] and they soon pointed out several weaknesses in the course. In October 1872 they noted that instruction was merely "the very simple and almost mechanical process of sending and receiving a telegram". They considered that each "pupil should possess a sufficient knowledge of the rudimentary principles of electrodynamics to warrant a degree of confidence being placed in her when in charge of instruments at a distant station". The examiners also considered that the class had insufficient practice because of an inadequate supply of equipment with which to train. They said that one set of instruments should be provided for each student; and that it would be preferable to have smaller classes and raise the standard of instruction than to have larger classes and turn out students who were inadequately trained to meet the requirements of the service in which they would be employed.[14] In a supple-

[7] *The Argus*, 23 August 1872, p. 5.
[8] *The Argus*, 3 July 1872, p. 5.
[9] *The Argus*, 21 Feb. 1876, p. 5.
[10] *The Illustrated Australian News*, Melbourne, 18 June 1872, p. 128 and p. 130.
[11] Annual Report of the Trustees, 1872, p. 11.
[12] Samuel Walker McGowan. Born 4 Jan. 1829 at Kingston, Canada. Deputy Postmaster-General, Secretary, and General Superintendent of Electric Telegraphs of the Post and Telegraph Department of the Colony of Victoria from 28 Dec. 1885 to 18 April 1887. Died 18 April 1887 at St. Kilda, Victoria.
[13] Until 1869 the Postal Department and the Telegraph Department were separate administrations in the colony of Victoria. In that year they were amalgamated, on 1 March, under the Deputy Postmaster-General, William Turner, who was a civil servant.
[14] Annual Report of the Trustees, 1872, p. 15, Appendix D.

mentary report, dated 18 November 1872, the examiners recommended that before students presented themselves for examination they should give evidence of being moderately proficient in writing and spelling, of having been instructed in the principles of static and dynamic electricity, of having received instruction in the theory of electric telegraphy and of having had practice in transmitting and receiving messages telegraphically.

In 1872 two examinations were conducted by the Museum in telegraphy. At the first examination 21 pupils presented themselves and 11 passed; at the second examination 20 pupils were examined and 15 passed. The annual report of the Museum Committee for 1876 gave without comment a list of pupils in the telegraphy class in that year; all were women, of whom 6 passed with credit, 7 passed, 10 did not pass, and 7 were not examined.[15] These results indicate that the examiners were intent on maintaining high standards. In 1879 two courses in telegraphy were held during the year and the pupils were still mainly women. No courses were conducted apparently in 1880; but the annual report of the Museum Committee for 1881 noted that "a class has been resumed at the request of the Postal and Telegraph Department". The last class in telegraphy at the Museum seems to have been conducted in the year 1887.[16] Thereafter, presumably, instruction of this kind was provided for the public at the Working Men's College in Melbourne.

The Director, in his annual report for 1876,[17] said that the metallurgical section, one of the most popular divisions of the Museum, had been greatly improved and entirely re-arranged. New models of furnaces suited for the treatment of auriferous and other ores and also a model of a sulphuric acid chamber had been added. All models were made in the Museum's workshop by the skilled workman, F. W. Barnard. He also pointed out that all classes had been well attended. In the laboratories many of the students had made good progress, some taking part in original investigations and working out new technical processes for application in the colony's workshops and factories. Good reports were received too of successes of students who had left the laboratories and were subsequently employed in applying the information they had gained there. The Director also said that five public lectures were delivered during the latter half of 1876,[18] the new lecture room was found to be well suited for public lectures and no fault had been found with either its acoustics or its lighting.

Obviously the Museum had to discharge many other functions concurrently with these teaching duties. One other such function was to prepare exhibits for display in public exhibitions. It was proposed to hold a series of annual international exhibitions in London from 1872[19] to 1880, and the Trustees were asked by the government of Victoria to take measures for the proper representation of the products and manu-

[15] Annual Report of the Trustees, 1875-76, p. 39.
[16] Annual Report of the Trustees, 1887, p. 31.
[17] Annual Report of the Trustees, 1875-76, pp. 33-4.
[18] Ibid, p. 38.
[19] The Second International Exhibition was opened in London on 1 May 1872 at South Kensington. The First International Exhibition had been opened in the previous year on 1 May, 1871.

factures of the colony of Victoria.[20] The Trustees accepted this task and allotted it to the Committee of the Industrial and Technological Museum for execution.

These exhibitions were intended to promote competition in industrial arts, scientific inventions and discoveries, and in fine arts including music. The British government appointed a commission to organise and administer these exhibitions, each of which consisted of three divisions, comprising fine arts, manufactures, and recent scientific inventions and new discoveries respectively. The classes of manufactures varied from year to year.

The Commissioners for the International Exhibition for 1873 requested the Trustees to provide space in the Institution's buildings for the exhibition of articles intended to be forwarded to London. The Trustees decided, on 21 June 1872, that they would make available as much accommodation for the purpose as the space at their disposal would permit[21] and they placed the Great Hall and annexes at the disposal of the Commissioners. The Exhibition was formally opened by the Governor of Victoria, Lord Canterbury, on Wednesday, 6 November 1872.[22]

Most of the exhibits were placed in the Great Hall. But the Museum authorities could not clear it entirely of its own display cases and so these were included in the catalogue of this special exhibition. Provision was made for the sale of refreshments inside the buildings and cellarage accommodation was also provided for the sale of wines, beer and bacon which had to be kept in a cool atmosphere. The exhibits were fairly evenly distributed over the available space. But the Great Hall, which had a length of 219 feet and a width of 82 feet, was the most attractive area for visitors. The Exhibition closed on Saturday 18 January 1873. Although the public advantages were considerable, its disadvantages to the Museum's staff, in their task of developing their newly established Museum, were also considerable.

A setback to the Museum's earlier development was the loss of the services of Mr Ulrich. His resignation from the Museum's staff was accepted by the Trustees at a meeting on 28 March 1878. For almost eight years he had held the dual position of Curator of the Mineral Collection and Lecturer in Mineralogy and Mining in the Museum. He left Victoria to take up the Chair of Mining and Metallurgy at Otago University and to become concurrently the first Director of the School of Mines in that university. The Trustees acknowledged the work he did for the Museum in the following letter:

PUBLIC LIBRARY, MUSEUMS AND NATIONAL GALLERY OF VICTORIA

16 April 1878

Sir,

I am requested by the Trustees to convey to you an expression of regret that you have severed your useful connection with this Institution.

They recognise the ability and zeal with which you have employed yourself in

[20] For a criticism of the nine International Exhibitions, see *The Argus* 21 July 1871, p. 4 (leader).

[21] For an interview with the Chief Secretary by Trustees and members of the Commission of the International Exhibition in London seeking money for building accommodation see *The Daily Telegraph* (Melbourne), 3 July 1872, p. 3.

[22] For a full report on the opening of the Exhibition see *The Argus* (*Supplement*), 6 Nov. 1872.

the skilful and scientific arrangement of mineral specimens in the Museum as well as in your laborious course of instruction in the schools.

I have the honour to be,
Sir
Your obedient Servant

Redmond Barry
PRESIDENT

The Trustees had then to find a replacement for Ulrich. Apparently they were unable to find anybody with similar academic qualifications and practical experience, because on 1 May 1878 Oliver Richard Rule was placed on the permanent staff of the Public Service of Victoria and appointed to the position of Mineralogist.[23] Rule was a Tasmanian who came to Melbourne in 1840 with his parents. Later he was apprenticed to a jeweller named Patterson in Geelong. After the gold discoveries in Victoria he went to the goldfields where he worked as a goldsmith in smelting and refining gold ore. From the goldfields he moved to Maldon where he went into business as a jeweller and watchmaker and in 1870 he moved to Melbourne.

Rule's duties at the Museum were to arrange and classify mineralogical, petrological and metallurgical collections. His commencing salary is not known but seven years later, in January 1885, it was £208 p.a.[24]

The Museum's loss of Ulrich's service in 1878 was followed in the next year by another serious loss in the death of Judge Bindon who died on 1 August 1879 at his residence in St Kilda, aged 67 years. Judge Bindon had been the chairman of the Committee of the Museum since its creation in 1870. His death was a serious loss to the Museum because of his deep personal interest in its purpose and its development. He discharged his duties as chairman with the zeal and industry of a man who believed in the value of technical education in the community and in the need to "sell" it not only to the government but also to the public whose interests it served.

His successor as chairman was Charles Edward Bright,[25] a brother of the British politician, Richard Bright, who, with John Cobden, had agitated in England for the repeal of the Corn Laws. Bright had arrived in Melbourne in January 1854; he was later a partner in the firm of Gibbs, Bright and Co., and he was on two occasions chairman of the Melbourne Harbor Trust.

At the end of the Museum's first decade the President of the Board of Trustees, Sir Redmond Barry, died and at the Trustees' monthly meeting, on 7 December 1880, the following resolution was passed:

That the Trustees desire to place on the record of their proceedings their feeling of deep sorrow for the loss the Institution has sustained by the death of

[23] Oliver Richard Rule. Mineralogist. Born at Hobart in 1835. Mineralogist of the Industrial and Technological Museum of Victoria from 1 May 1878 to 28 April 1892. Died 6 May 1926 at Caulfield, Melbourne. See *The Argus*, 7 May 1926, p. 10.

[24] *V.G.G.*, No. 12, dated 31 Jan. 1885, p. 395.

[25] Charles Edward Bright, C.M.G. Born 1829. Chairman of the Committee of the Industrial and Technological Museum of Victoria, 1879-82. Died 17 July 1915.

> Sir Redmond Barry, who, for twenty-seven years, filled with zeal, urbanity, and distinguished ability, the office of President of the Public Library, which owed its foundation to his public spirit, energy, and ardent sympathy with the cause of public education and refined enjoyment.

At this same meeting the Trustees elected David Charteris McArthur,[26] a banker in the City of Melbourne, to the vacant office of President.

McArthur is one of the great figures in the history of the Bank of Australasia (which merged in 1951 into the newly-created Australia and New Zealand Bank).[27] He was a man who combined initiative and resource with caution and sound judgement. After leaving school he joined the North British and Mercantile Insurance Co. of Edinburgh. Later he joined the service of the Bank of Australasia in London. From there he was sent to Sydney to be the accountant and teller at the Sydney branch which was opened in December 1835. Later he was transferred to Melbourne to open the Bank's first branch in that city on 28 August 1838. In 1863 he became the bank's chief inspector for Australasia and in 1868 general manager, or superintendent as the position was called officially. He retired on pension in 1876. He was Chairman of the Associated Banks for many years and in that position he built up a high reputation for tact, firmness and integrity.

From the outset McArthur became a prominent citizen in Melbourne. He was one of the original five trustees of the Public Library of Melbourne who were appointed on 20 July 1853; he was one of the founders of the Mechanics' Institute of Melbourne which later developed into the Melbourne Athenaeum; and he was one of the original trustees of the Botanical Gardens of Melbourne.

McArthur had been chairman for twelve months when, on 29 December 1881, Colonel Ellery[28] was appointed to the Board of Trustees. Four months later Ellery came into closer touch with the Museum for, on 19 April 1882, he was elected chairman of the Committee of the Museum, succeeding C. E. Bright.

Ellery brought good qualities and qualifications to his work on the Museum's committee. He was born in England and qualified there to be a medical practitioner; he migrated to Victoria in 1851 and was said to have practised medicine in Williamstown for a short time after his arrival in the colony. In July 1853 the government of Victoria appointed him to the position of Government Astronomer, and it instructed him to establish a solar observatory and to superintend it in the appointment of director. He remained in this position for the next forty-two years. To the Museum, Ellery was a strong and useful chairman of its committee. He was not a scientist in the present-day sense; but he was a good administrator with a practical and scientific attitude to his work. His versatility and industry impressed all who knew him and he

[26] David Charteris McArthur. Born probably in 1810. President of the Board of Trustees of the Public Library, Museums and National Gallery of Victoria from 7 Dec. 1880 to 23 April 1883. Died 15 Nov. 1887. See Garryowen, "Reminiscences of D. C. McArthur", *The Herald*, 17 Nov. 1887, p. 2.

[27] S. J. Butlin, *Australia and New Zealand Bank* (Longmans, 1961), p. 65.

[28] Lieutenant-Colonel Robert Lewis John Ellery, C.M.G., F.R.S., F.R.A.S. Born 14 June 1827. Chairman of the Industrial and Technological Museum from 19 April 1882 to 14 Jan. 1908. Died 14 Jan. 1908.

excelled in unexpected and in seemingly incompatible directions. Besides being a good musician he was also a skilled carpenter; he was a good team leader and for some years he commanded the Torpedo and Signal Corps which was a part-time unit of the colony's military forces. He attracted men with ability and attainments to the Melbourne Observatory where, by good management, he obtained the best results from their collective work. The Observatory gained, in consequence, a high reputation in the scientific world of his time. He was one of the founders of the Royal Society of Victoria, and was its president from 1856 to 1884.

At a special meeting of the Board of Trustees on 9 October 1882 Ellery shared in the making of two decisions which are of historical interest today. He reported at this meeting that the Australian Electric Co. would light the Institution at a price not exceeding that paid during that current year—this referred, presumably, to payment for gas illumination. The Trustees decided "That it is desirable that the Institution be lighted by the electric light if suitable arrangements can be entered into". The other decision on this occasion was "That it is desirable that telephonic communication with the Exchange be established"; and this was presumably just a stilted and cumbersome way of saying that it approved of action being taken to install a telephone in the Institution.

The year after Ellery took up the chairmanship of the Museum's committee the already familiar question of Sunday opening came up again for consideration by the Trustees. At the monthly meeting on 23 April 1883, Professor Strong's motion "That it is desirable to open the Public Library and Picture Galleries during certain hours on Sundays" was carried by five votes to three. This meeting was adjourned to 30 April 1883 when the Hon. Edward Langton, who was the Treasurer to the Board of Trustees, moved, and his motion was carried by eight votes to three: "That the Technological Museum and the Galleries be opened to the public each Sunday during the month of May from 1.30 p.m. to 5 p.m.".

When these motions became known publicly there were violent reactions and the Premier, the Hon. James Service, addressed the following letter to the President of the Board of Trustees:[29]

TREASURY
3 May, 1883

Sir,

I have the honour to inform you that a very large deputation of the citizens of Melbourne and of clergymen of various denominations, but specially representing the Presbyterian Assembly, waited upon me this day in reference to the recent action taken by the trustees with a view to the opening of the Public Library and Museum on Sunday.

The deputation expressed themselves as strongly opposed to that action. They pointed out that on all occasions on which Parliament had been asked to express an opinion on the subject, it had pronounced emphatically against the opening, and they considered it unfair, that the trustees should, whilst Parliament was in recess, take the opportunity of running counter to its repeated expressions of opinion in this respect.

[29] *The Argus*, 5 May 1883, p. 10.

In reply I pointed out to the deputation that the Government had no direct control over the trustees in respect to the picture gallery and museum, but that I would undertake to communicate to the trustees the opinion of the deputation that the gallery and museum should not be open on Sundays till after Parliament meets, and has an opportunity of again expressing its will on the subject.

I further undertook to inform the trustees that the Government concurred in this expression of opinion, which I have now the honour to do accordingly.

I have the honour to be,
Sir
Your obedient Servant

James Service
PREMIER

The Honourable Sir George Verdon, K.C.M.G., C.B.,
Chairman of the Trustees,
The Public Library, Museum and National Gallery.

The Board of Trustees held a special meeting on 4 May 1883 to consider the Premier's letter. Sir James McCulloch's motion that action to open the Museum and National Gallery on Sundays be postponed was defeated by the following amending motion proposed by the Hon. C. H. Pearson:

> That the Premier be informed, in reply to his letter, that the Trustees, in resolving to open the Museum and National Gallery on Sundays, are exercising the power and discretion conferred upon them by law; that they consider the experiment they propose to try will be useful to Parliament in determining the whole matter when it meets; and that they therefore regret that they cannot defer to the opinion of the Premier, without evasion of the responsibility properly devolving upon the Trustees.

The amendment was carried by a single vote.[30]

Concurrently, moves and counter moves were being made in Melbourne by organisations for and against Sunday opening. A public meeting was held in the Melbourne Town Hall, on Thursday, 3 May 1883, by those in favour of Sunday opening.[31] Mr Justice Higinbotham presided at the meeting; and it was described as "one of the largest and most enthusiastic ever held in Melbourne". A Sunday Liberation Society was formed. It took a special interest in pressing the claims of those who favoured Sunday opening. But another organisation, the Sunday Observance League promoted the cause of those who opposed the Trustees' decision to open on Sundays. The public's feelings in this controversy were reflected in the number of people who visited the Industrial and Technological Museum and the National Gallery on Sunday, 6 May 1883. On that day, from 1.30 p.m. to 5 p.m., the turnstiles recorded almost 6,000 visitors.

The Sunday Observance League reacted sharply to this trend. The following evening, Monday, 7 May 1883, it held a large protest meeting in the Melbourne Town Hall

[30] *The Argus*, 5 May 1883, p. 10.
[31] For a report on proceedings of the meeting see *The Argus*, 4 May 1883, p. 7.

under the chairmanship of the Hon. Francis Ormond, M.L.C.[32] It was as largely attended as the meeting held there four nights earlier by the Sunday Liberation Society to promote the opposite cause.

Newspapers were filled with letters for and against the Trustees' decision to open the Institution on Sundays; they published reports of campaign meetings of groups for and against Sunday opening; and they provided readers with feature articles on the subject. In a letter published in *The Argus* later that month,[33] Alfred J. Taylor of the Public Library in Hobart said:

> Libraries, art galleries and museums will all be thrown open to the public on Sunday afternoons. Of this I feel assured. It is only a question of time. In England, museums are open on Sundays in Birmingham, Manchester, Stoke-on-Trent, Stratford-on-Avon, and Dunmow. . . . The interest taken in the matter by the working men is shown by the fact that 46,000 votes in favour of Sunday opening in England came from men's clubs.

In this campaign the Trustees presented an immovable front, and the Museum[34] and the National Gallery remained open on Sundays during the month of May 1883. But opposition to their decision was gaining strength in Parliament. In the Legislative Assembly, the following motion by the Member for Collingwood, Mr. James Mirams, was carried on 4 July 1883 by 37 votes to 12:

> That this House having invariably refused to sanction the opening of the Public Library, Museum and Picture Gallery on Sundays condemns the recent action of a section of the Trustees in opening a portion of those institutions on that day, and affirms its opinion that this being a question of public policy, it is the prerogative of Parliament alone to decide it.
>
> This House further considers that the non compliance of the Trustees with the request of the Government to postpone their action in the matter until Parliament had an opportunity of again deciding the question was a slight upon the Government and an infringement on the rights of Parliament.
>
> Further, that the Trustees be called upon to immediately revert to the original practice, and close the institution under their charge on Sundays until Parliament shall otherwise determine.[35]

In his explanation of this motion to the House the Member for Collingwood said: "What we desire to do by this resolution is simply to vindicate the right of Parliament to settle the question and not to allow any outside authority to do so."

The Trustees were now faced with very formidable opposition—that of Parliament itself. They held a special meeting on 6 July 1883 to consider a letter from the Chief Secretary's Department[36] informing them that the resolution of the Legislative Assembly on 4 July 1883 made it impossible for the Chief Secretary to advise the

[32] *The Argus*, 8 May 1883, p. 10.

[33] 22 May 1883.

[34] The National Museum of Victoria was located, geographically, in the grounds of the University of Melbourne and so it was not involved in this controversy.

[35] *V.P.D.*, 4 July 1883, Vol. 43, p. 49.

[36] For the text of this letter, dated 6 July 1883 see *The Argus*, 7 July 1883, p. 11.

Governor-in-Council to approve of the regulation authorising the Sunday opening of the Museum and the National Gallery. The Trustees had been driven into a position in which they could take no alternative action. At this meeting, therefore, they passed the following resolution:[37] "That in deference to the resolution of the Legislative Assembly the Museum and Galleries be closed on Sundays". The Trustees then issued internal instructions that the Industrial and Technological Museum and the National Gallery were henceforth to be closed on Sundays.[38] The Trustees had been outmanoeuvred and defeated. It will be seen later, however, that in bowing to the inevitable on this occasion the Trustees did not regard the situation as final and unalterable.

[37] For a report of the proceedings of this meeting see *The Argus*, 7 July 1883, p. 11.
[38] For a leader on this subject see *The Argus*, 9 July 1883, p. 5.

Chapter 3

Last Decade of the Newbery Era (1885-95)

The latter half of the nineteenth century was an age of exhibitions in Australia and overseas. Their object was the promotion of trade and commerce and in particular the boosting of the sales of manufactured goods—the industrial products of applied science. These exhibitions had their origin in London's Great Exhibition in Hyde Park in 1851. More were held later in Great Britain; and others were held in Europe, in the U.S.A. and in the Australian colonies. In Melbourne in 1854 there was a display of exhibits from 12 October to 12 December which had been prepared for display at the Paris Exhibition of 1855. Similar previews were given later in Melbourne of exhibits prepared there for despatch to exhibitions in other Australian colonies and in overseas countries. We have already seen that when the Industrial and Technological Museum opened in 1870 many of its exhibits had been inherited from the Intercolonial Exhibition of 1866 which had been held in Melbourne.

In 1885 Newbery found himself responsible again for tasks which had become familiar to him in previous exhibitions in Melbourne in 1872, 1875[1] and in 1880-1.[2] This time they were tasks connected with the preparation of exhibits for the Colonial and Indian Exhibition of 1886 in London.[3]

The Exhibition itself in London was a remote thing for the staff of the Museum in Melbourne. But more immediate and more realistic was the Museum's task of preparing, well in advance, its own exhibits so that they reached London in time for the Exhibition's opening.

The Museum prepared for exhibition a collection of Australian timbers, including samples of veneers to be obtained from Victoria's more ornamental woods, and it was said that the collection was the finest of its kind that had been prepared. Miss Hodg-

[1] The Victorian products to be shown at the Philadelphia Centennial Exhibition of 1876 were displayed in Melbourne at an Intercolonial Exhibition which was opened on 2 September 1875. See Annual Report of Trustees, 1877, p. 57. See also *The Argus*, 3 Sept. 1875, pp. 5-6.

[2] On 1 October 1880 the first International Exhibition to be held in Melbourne was opened in a permanent building erected for the purpose in Carlton Gardens; and it closed six months later on 30 April 1881. Newbery was the Chairman of Jurors of this Exhibition and for this work and other public services he was created a C.M.G. in October 1881 (see *The Age*, 24 Oct. 1881, p. 3).

[3] *V.P.P.* Vol. 3 (1887), Paper No. 88. Report of the Royal Commission for Victoria at the Colonial and Indian Exhibition, 1885-86.

kinson and Miss McMillan of the Museum's staff also prepared a large collection of models to illustrate types and varieties of Victoria's acclimatised fruits.[4]

The Victorian Court was located in the centre of the Exhibition and it was spread over three galleries, the principal one of which was devoted to paintings, photographs and other works of art, agricultural exhibits, gold trophies, meteorological and technological collections and other exhibits. The conservatory occupied one side of the Court into which it opened direct.

Queen Victoria formally opened the Exhibition at South Kensington on 4 May 1886. It closed six months later on 10 November 1886. The interests of the colony of Victoria at this exhibition were entrusted to the Victorian Commission of which Joseph Bosisto, M.L.A.[5] was the President. He had a strong interest, not widespread in his time, in technical education; and in his reports from London to the government of Victoria he stressed the need in Australia to train artisans and to study scientifically, the growing of silk, vines and tobacco.

At this time too Newbery was again obliged to direct the Trustees' attention to the ever-present and unsatisfied need for more space if the Museum was to grow and to keep pace with developments in the fields of applied science.[6] It was indeed difficult for him to carry on efficiently the Museum's practical work for the want of suitable laboratory accommodation and because of insufficient space in which to accommodate the staff and students and to display the Museum's collections. This discouraging situation for the staff was also present in other branches of the Institution. Therefore, in the Trustees' annual report to the Chief Secretary for 1886 they felt constrained to point out to the Government that:

> The completion of the north wing for books, and the permanent erection of the Technological Museum, now sheltered by a roof which was built in 1866 to serve a temporary purpose, and which was designed to stand for nine years and has lasted twenty-one, cannot be much longer delayed, and we respectfully submit for the consideration of the Government the whole question of the expenditure required to keep up the efficiency and usefulness of the Institution which from its very nature must continually grow.[7]

But the President of the Board of Trustees, at this time Sir George Verdon, and his fellow-members were not concerned exclusively with the Museum's problems of space, despite their importance. At the Trustees' general meeting on 27 April 1885 they made a major change in the organisation for the internal administration of the Institution. On the motion of Andrew Harper, it was decided: "That all Trustees be members of the Sectional Committees, except the Building Committee". Later, the Trustees recorded ambiguously that "Since the 1st September 1885 the Industrial and

[4] Annual Report of the Trustees, 1886, p. 20.

[5] Joseph Bosisto, C.M.G. Pharmacist and Politician. Born, 21 March 1824 at Leeds, England. Sometime Chairman of the Technological Commission of Victoria. Died 8 Nov. 1898 at Richmond, Victoria.

[6] Annual Report of Trustees, 1886, p. 4.

[7] Ibid, p. 5.

Technological Museum and the National Gallery have been open daily from 10 a.m. to 5 p.m., and the change seems to be appreciated by the public".[8] This decision presumably did not cover Sundays about which more was to be heard later. Two months after this event the Trustees, at their meeting on 30 November 1885, made the Building Committee conform to the policy it had laid down in April 1885 in respect to membership of the Sectional Committee. Henceforth, all trustees were members of each sectional committee and also of the Building Committee. The Trustees made no change, however, in the method of electing chairman for each of these committees. They said, in their annual report for 1886, that:

> Each of the sectional committees now consists of all the Trustees under a chairman *specially chosen* to conduct the business; and it has been resolved that the sectional reports shall merge in that of the whole body of Trustees. The reports of the heads of the several departments with their appendices, which are made to the sectional committee will be continued, and from them all the particulars of the working of the committees may be ascertained without being repeated, as heretofore in the reports.[9]

This change deprived the chairmen of sectional committees henceforth of the opportunity to criticise, to make recommendations, and to express opinions in a permanent and official form by means of annual published reports. Another disadvantage was that henceforth the Trustees' annual reports did not identify by name the chairmen of sectional committees. Neither was this always done in the minutes of meetings of the Trustees. At one stage for some years the writer of the minutes of Trustees' annual meetings merely recorded that: "The chairmen of the sectional committees were re-elected *in globo*".[10] Another loose and inefficient system of recording attendances in minutes of proceedings of meetings, which was allowed to persist, was to write not "The Chairman, Mr Smith" but "Mr Smith in the Chair". With records of this nature, made primarily it seems to display scraps of Latin knowledge it is not always easy, today, to determine with certainty the names of elected chairmen in those now far off times of last century. This is especially so if, during the year, there had been a turnover of sectional committee chairmen because of deaths or resignations. The effects of this whole change were to make everybody's business nobody's business; it was a system that might have been conceived by office boys for the convenience of office boys!

Although Trustees come and go, individually, the staff they administer remains to carry out collectively their policies and other instructions. The Museum's staff at this time did much good work, but it was often done under discouraging working conditions and it rarely received any eulogies from the press or the public. The Director reported for instance, that during the year 1886 the Museum's students in applied chemistry were doing good work; that A. E. Savage had continued his investigations

[8] Annual Report of the Trustees, 1885, p. 4.

[9] Annual Report of the Trustees, 1886, p. 3.

[10] See Minutes of Meetings of the Board of Trustees for 13 April 1893, 25 April 1895 and 27 April 1899.

into the problems of contamination of air and water by micro-organisms which were detrimental to health, and that some of Savage's results had already brought about improvements in local sanitation. But there had been difficulties at the Muesum in doing this work. There was insufficient suitable laboratory accommodation, and the work had unfortunately been delayed because Savage had been induced to resign in order to take up a better-paid position elsewhere. The Director pointed out that the authorising of "a small expenditure of money" on this work would "materially benefit the whole community".[11]

In February 1887, because of heavy demands being made on bed accommodation at Melbourne's three main hospitals, it was found that destitute persons, who were suffering from typhoid fever, could not gain admittance to these hospitals. The government therefore instructed the Central Board of Health to provide temporary accommodation for the care and treatment of destitute persons who were suffering from typhoid fever.[12] This was done by the erection of tents at the Alfred Hospital in Prahran. A man named L. Hesse who was probably on the Museum's staff took charge of this temporary typhoid fever camp at the hospital; and he conducted it under the direction of Victoria's Central Board of Health. At this camp too Hesse was able to continue his work in the application of the results of Mr Savage's work.[13]

This Central Board of Health consisted of a full-time president and nine part-time members, one of whom was James Cosmo Newbery.[14] Its main functions were to devise and execute measures for the preservation of public health, and in particular for the prevention and control of contagious diseases.[15] The Board's Annual Report for the year ended 31 May 1887 referred to the subject of Water Pollution of which it said: "The pollution of the water of our rivers and streams is a most serious matter, especially in the country districts, where the population has frequently no other source of supply for domestic use".[16] It reads like a news item of today. But another part of this report said: "In consequence of the lamentable illness of our colleague, Mr J. Cosmo Newbery, we are unable to do more than briefly allude to this all important question."

Newbery's illness resulted from his involvement in a railway collision. Late on Wednesday afternoon, 11 May 1887, near Windsor Station, an express train ran into a slow train travelling in the same direction; and Newbery was a passenger in one of them. At first it was thought that he was not seriously injured because he walked from the wreckage to the Alfred Hospital in Prahran. But there he was found to have suffered serious internal injuries and he was admitted for treatment. Improvement

[11] Annual Report of the Trustees, p. 19.

[12] *V.P.P.*, Session 1887. Vol. 2, Paper No. 63, Report of the Central Board of Health for the Year ended 31 May 1887.

[13] Annual Report of the Trustees, 1886, p. 19.

[14] Newbery had been appointed to this Board on 20 November 1883. See *V.G.G.*, No. 116, 20 Nov. 1883, p. 2623.

[15] *Victorian Year Book for 1885-6*, p. 340 and pp. 748-64.

[16] *V.P.P.*, 1887, Vol. 2, Paper No. 63, Report of the Central Board of Health for the Year ended 31 May 1887.

came slowly, and on 15 September 1887 the Trustees granted him twelve months leave of absence. Six months later, on 31 March 1888, they found no comfort in having to report that "Mr Cosmo Newbery is still suffering from the effects of the Windsor railway accident"; they expressed their sincere sympathy with him; and hoped that "he may soon be restored to health and enabled to resume the important duties he has so well fulfilled at the Museum for many years."[17] A year later, in March 1889, the Trustees were able to report that "Mr Cosmo Newbery has returned to duty as Superintendent in better health, and the Trustees are very glad to have the benefit of his personal assistance in . . . the Institution."[18] Although Newbery had resumed duty in "better health" he was never again to regain his former state of health.

The work of the Industrial and Technological Museum in providing theoretical training in various branches of applied science since it opened in 1870 had stimulated interest in technical education in the colony of Victoria; and it brought about thereby an increased awareness of its importance if the colony was to maintain and develop itself industrially. A person outside the Museum who had also been giving much thought to the need for more technical education was the Hon. Francis Ormond, M.L.C. (1829-89). His proposal was for a wholly teaching institution to enter the field which the Museum had pioneered in Victoria. The Museum's interest in Ormond's proposal to establish a Working Men's College in Melbourne may be said to have originated in May 1882. On the fourth day of that month the Trustees discussed Ormond's proposal and the Hon. C. H. Pearson[19] moved: "That steps be taken to increase the courses of lectures given under direction of the Trustees . . . and to systematise the instruction in them, so that the teaching . . . may discharge all the requirements of a Working Men's College". Pearson had already established himself as an authority on education in Victoria and his *Report on the State of Public Education in Victoria and Suggestions as to the Means of Improving it*, a Royal Commission report, was a document of significance when it was published in Melbourne in 1878.[20] Nevertheless, the Trustees did not adopt Pearson's motion at this meeting; instead they decided to ask Ormond to meet them in conference to discuss his proposal before he proceeded further with it.

This discussion between the two parties took place at a special meeting of the Trustees on 11 May 1882. There the Trustees assured Ormond of their desire to help him to establish the college he had in mind; and they suggested to him that he should arrange for the college, when opened, to use the Museum's collection and the Public Library's books. The Trustees believed also that optimum use could be made of its facilities if the Working Men's College were built in close proximity to their own Institution. Ormond informed the Trustees that he intended to discuss his proposal

[17] Trustees' Annual Report for 1887, p. 4.

[18] Trustees' Annual Report for 1888, p. 4.

[19] The Hon. Charles Henry Pearson, M.A.(Oxon), Hon. LL.D.(St. Andrews). Statesman, teacher and historian. Born 7 Sept., 1830 in London. Died 29 May 1894 in England.

[20] John Tregenza, *Professor of Democracy: The Life of Charles Henry Pearson, 1830-1894—Oxford Don and Australian Radical*, (M.U.P., 1968), pp. 123-36 and 205-7.

further at a public meeting to which he would invite representatives of the Trustees, the Trades' Hall, the University of Melbourne, the government of Victoria and subscribers.

This meeting, which was conducted under the chairmanship of the Mayor of Melbourne, Alderman C. J. Ham,[21] took place at the Melbourne Town Hall on 26 May 1882, the Trustees' representatives being the Hon. C. H. Pearson and the Hon. W. M. K. Vale. The chairman said, in opening the meeting, that they had assembled to discuss three points in connection with the establishment of the college which had been made possible by Mr Ormond's conditional offer of £5,000. The first was the selection of a site, the second was the nature of the governing body of the proposed college, and the third concerned the means of raising the money that was required for the project. It was agreed that the governing body should be a council made up of twenty members, two of whom were to be nominated by the Trustees of the Public Library, Museums and the National Gallery of Victoria.

Ormond proposed the appointment of a committee to carry out preliminary work, secure the land and devise means for the raising of the required money. The committee consisted of Ormond himself, as chairman, and six members, three of whom—Colonel Ellery, the Hon. C. H. Pearson and Mr Vale—were Trustees of the Public Library, Museums and National Gallery of Victoria. Ellery was also the chairman of the Industrial and Technological Museum which was the branch of the Institution most concerned in this Ormond project.

The chairman of the meeting, Alderman Ham, said that when things had developed further he proposed to call a public meeting of citizens to ask for their support for the project.

At a subsequent meeting of the Trustees, on 8 November 1882, Pearson and Vale were elected to represent them on the Permanent Council of the Working Men's College. This representation of the Trustees on this council continued for the next 31 years.[22]

In his appreciation of the advantages of a technical college to the community, Ormond was far ahead of his time. He had grasped the potentialities of technical training and the boon it could be to the working classes; but the irresponsiveness of these classes to his appeals and their immovable apathy in face of his munificent benefactions, were due to a want of a clear perception of his objectives. They needed to be educated to appreciate the benefits which such a college would confer on them; and Ormond patiently waited for the growth of this enlightenment.[23]

The inauguration of the Working Men's College took place at a public meeting at the Melbourne Town Hall on Friday evening 6 May 1887; it was held there because

[21] *The Argus*, 27 May 1882, p. 10.

[22] At a meeting of the Trustees on Thursday, 27 November 1913, a letter was received from the Acting Director of the Working Men's College stating that representation of the Trustees on the Council of the College would cease on 31 December 1913 with the expiry of Sir Edward Carlile's term of office.

[23] C. Stuart Ross, *Francis Ormond: Pioneer, Patriot, Philanthropist* (Melville & Mullen Ltd., London, n.d.) p. 108.

the College's own buildings were not ready for occupation; and the meeting was presided over by the Hon. Francis Ormond. In the course of his opening address he pointed out that the best possible educational facilities needed to be placed within reach of the young artisan, and that this education should aim to cultivate his intellect and to give him a scientific understanding of the theory on which his trade or business was based so that he would cease to be dependent on "rule of thumb" methods to guide him in his work.[24]

A month later, on 7 June 1887, the College's lecture hall was crowded. The occasion was the first general gathering of young men who had enrolled at the College to pursue courses, and they had assembled that evening to listen to an address by the President of the College Council, the Hon. Francis Ormond. The President began his address that evening by saying:

> Students of the Working Men's College! I cordially and heartily welcome you to this your educational home: yours, because the building so far has been erected by voluntary contributions, and as you are to pay for instruction, this College cannot in any way be regarded as a charity. There are times and occasions for rejoicing and surely this is one. Long and longingly have I looked forward to this day, the commencement of the educational work which is to be carried on here.

Later in this address he said:

> The series of lectures which was begun last month will be continued throughout the winter. Good lectures are a valuable means of imparting instruction. They induce a spirit of inquiry and awaken a desire for higher education. . . . The necessity for the scientific and technical training of the working classes is now prominent in the minds of thinking people. France, Germany, Switzerland, Belgium, Bavaria, and other countries are expending vast sums of money in this direction . . . Our College is central and convenient, and its proximity to the Industrial and Technological Museum, National Gallery, and Library places their resources within your easy reach for reference.[25]

The Trustees had hitherto undertaken the educational tasks which the Working Men's College was at this time to take over and conduct henceforth on a larger scale and with more adequate teaching facilities. From the outset the Trustees had co-operated wholeheartedly with the Hon. Francis Ormond and the Council of the Working Men's College in helping to bring their aims to fruition.

Soon after the successful launching of the Working Men's College in Melbourne, fortune smiled on the Trustees and the Industrial and Technological Museum. The Trustees were successful in obtaining a promise of £90,000 for building purposes from the Gillies government.

The Trustees decided to extend, initially, the eastern block to provide a museum and two art galleries on the north side of what were then the picture galleries. The estimated cost of these extensions was £45,000, and the Trustees decided not to call for competitive designs. Instead they instructed the architects to prepare plans and

[24] *Ibid*, pp. 147-8. See also *The Argus*, 7 May 1887, p. 11.
[25] C. Stuart Ross, *Francis Ormond: Pioneer, Patriot, Philanthropist*, pp. 149-53.

working drawings, and to obtain tenders for the erection of these buildings. The new buildings, later designated the McCoy Hall, the La Trobe Gallery, and the Stawell Gallery, were to accommodate the new Industrial and Technological Museum, a gallery for pictures and a gallery for sculptures.[26] The erection of these buildings necessitated the removal of the existing laboratory, lecture hall, and offices connected with the Museum. It was decided that the Trustees should not erect another laboratory, and the services of the assistants connected with that branch of the Museum were dispensed with. The Director, James Cosmo Newbery, whose agreement with the Trustees included the free use of the laboratory, was compensated by an increase in salary and by other concessions, and he was allowed the right of private practice in analytical work in his own laboratory.

F. Lockington's tender for the erection of the new Industrial and Technological Museum and two art galleries for £44,208 was accepted in April 1890. An advance of £37,000 was voted on the Public Works Department Estimates for 1890-91.

The contractor made good progress and there was no delay in bringing these buildings to completion. The Trustees reported about two years later that: "The collections of the Industrial and Technological Museum are being removed to the new building". The Museum's new building was the McCoy Hall and the Director took the opportunity of rearranging the collections and in this re-arranging to exclude duplicates and unsuitable objects and also to make room for the extension of other classes and the inclusion of new ones. Several small collections of duplicates were donated to local schools of mines. At this stage the Trustees left the specimens illustrating economic botany in the old building "for the present" where they formed a complete Museum in themselves.[27] It seems that the Director made the fullest use of this occasion to unload accumulations of unwanted specimens for he said in his annual report for 1892 that: "Several collections of minerals and timbers have been presented by the Trustees to kindred institutions and scientific individuals, and objects have been from time to time lent to the Working Men's College".[28]

The Museum was attracting more public attention at this time than hitherto and the Trustees were gratified to find, as they reported, that: "their efforts to render the Public Library, Museums and National Gallery useful and attractive to the public have been so well appreciated, that no less than 754,943 persons visited these institutions during 1889, showing a large increase over the number of visitors in any previous year."[29] In the year 1890 the Trustees were glad to find that the Museum continued to supply practical information and to give assistance to large numbers of inventors and others engaged in developing the country's resources and in promoting the various industrial enterprises which contributed so much to its prosperity.[30]

The Director of the Museum was able to report that the Museum had sent to the

[26] The Annual Report of the Trustees, 1889, p. 5.
[27] Annual Report of the Trustees, 1892, p. 4.
[28] Ibid, p. 20.
[29] The Annual Report of the Trustees, 1889, p. 5.
[30] The Annual Report of the Trustees, 1890, p. 7.

Paris International Exhibition of 1889, which opened on 6 May, a collection of fruits and timbers. It was there, as the central feature of this exhibition, that the Eiffel Tower was erected.[31] The head of the Museum's Economic Botany section, C. Walter, informed the Director in March 1891 that: "This section has undergone a complete change, having been re-arranged and classified in conformity with your direction, according to the various natural products, from the previously-adopted botanical system". Then after paying this compliment to his Director, Mr Walter went on to say that: "It is gratifying to notice how much this change is appreciated by the general public, as twelve months ago visitors to the museum would pass this important section almost unnoticed, while now it is visited constantly, and examined carefully and frequently by persons with notebooks in hand to obtain desirable information".[32] In this re-arrangement the needs of students were not neglected. The label attached to each specimen not only had its botanical name and classification corrected up-to-date, but also gave, as far as practicable, the habitat, quality or organic principles, and uses. Printed catalogues at the ends and at the intersections of the cases indicated where each particular product could be seen.

The Museum's collection of foreign minerals had been re-arranged. The Department of Mines handed over its valuable foreign collection for incorporation with that already held in the Museum. The whole, when classified, made a most important collection.[33]

But in the building up and improving of the Museum and the other branches of the Institution, the Trustees believed that their efforts were being unnecessarily retarded by the Public Service Board's control of its staff. The Trustees complained that its obligation to observe the provisions of the Public Service Act 1883-89[34] inflicted great difficulties on its own administration of the staff of the Institution.

The Vice-President of the Board of Trustees, the Hon. Edward Langton, said, in a letter dated 7 March 1890 to the Chief Secretary, that:

> Since the application of the Public Service Act to the Institution, the Trustees have been beset with difficulties in administering its affairs; and the subject has constantly occupied their attention with the results that no practical relief has been obtained. One difficulty has no sooner been removed than another occurs and the time of the Trustees is largely occupied in discussing matters in connection with the Public Service Act, and in endeavouring to find an escape from the embarrassment caused by its operation.
>
> Prior to the passing of the Public Service Act[35] the practice had been for the Trustees to nominate, in the case of higher officers, two persons, and in the

[31] *V.P.P.*, 1890, Vol. 4, No. 209. Report of the Royal Commission for Victoria at the Paris International Exhibition of 1889.

[32] Annual Report of the Trustees, 1890, p. 40.

[33] Annual Report of the Trustees, 1889, p. 38.

[34] The principal Act was *The Public Service Act 1883*. An amending Act, *The Public Service Act 1889*, which was assented to on 7 Nov. 1889, was the immediate cause of the Trustees' complaints early in 1890.

[35] Presumably the writer was referring to the principal Act, *The Public Service Act 1883* (*No. 773*) which was assented to on 1 Nov. 1883 and subsequent amending acts.

> case of lower officers, one person, the Government having given an undertaking to appoint one of the two nominated in the first instance, and in the latter case the person nominated. The appointment and promotion of the officers, their remuneration, qualifications and duties were practically dealt with by the Trustees only. This system had worked with satisfaction, and the Trustees regretted to find that the officers under their direction had been brought within the provisions of the Public Service Act without any intimation of this intention having been given to them or to Parliament, and without their opinion having been sought or their wishes consulted in the matter. It has never been urged that there were any valid reasons for this change, while strong arguments have been urged against it.[36]

The Board of Trustees was persistent in this matter. It was recorded, for instance, in the minutes of its meeting of 27 August 1891 that:

> The President reported verbally that he had interviewed the Honourable the Premier and had placed before him the views of the Trustees with regard to the trouble and inconvenience in the administration of the Public Library, Museums and National Gallery consequent upon the application of the Public Service Act to the Institution. The Premier assured him that he was anxious to remove all causes of trouble arising from the working of the Public Service Act, and that he had the matter under consideration and would prefer that the Trustees should refrain from petitioning Parliament for relief from the Act at the present time.

Then, in the following year, at its meeting on 19 May 1892, the Board of Trustees decided to postpone further action in this matter.

The Public Service Board agreed to make some regulations governing candidates' qualifications for a variety of positions in the Institution.[37] But the powers, under the Public Service Act, to control the staff of the Institution by means of appointments, promotions, transfers, dismissals, resignations and retirements, were not transferred from the Public Service Board to the Institution's Board of Trustees either then or later. The best reason for the government's non-compliance with the wishes of the Trustees in this matter was given in a leader of *The Age* which said:

> It should be clearly understood that it is not in accordance with the spirit of colonial institutions that absolute power should be given to any man or committee over men employed and paid by the public. Discipline must of course be maintained, but not by the power of a superior officer to appoint, promote, degrade or dismiss his inferiors at his caprice.[38]

However, the Trustee's disappointment over the Public Service Act's effects on the Institution's personnel administration was soon replaced by something of a more pleasing character. In 1893 Trustees reported that: "The removal of the contents of the Industrial and Technological Museum to the new building has been completed, and some important additions have been made to the mineral and rock collections by

[36] For the full text of this long letter see *The Age*, 11 March 1890, p. 6.

[37] See *The Argus*, 18 March 1890, p. 11, for the text of a letter from the chairman of the Public Service Board of Victoria, T. Couchman, dated 14 March 1890, to the Chief Secretary. This letter was a reply to that of the Hon. Edward Langton dated 7 March, 1890.

[38] *The Age*, 11 March 1890, p. 4.

purchase and gifts".[39] The space and the lighting provided in this new building (now called the McCoy Hall) enabled the Museum's collections to be displayed and studied to better advantage. Owing to financial difficulties there had been some delay in finishing off the buildings but on 11 March 1893 the new Industrial and Technological Museum, and the picture galleries on the north and the west of it, were opened to the public.

Concurrently with the finalisation and subsequent execution of the plans for the Museum's new building, the old question of "Sunday Opening" re-appeared. In July 1890 a further attempt was made by the Victorian Sunday Liberation Society to have the Museum, and other branches of the Institution, opened on Sundays. The society organised a public meeting at the Melbourne Town Hall on Monday evening, 14 July 1890. It was conducted under the chairmanship of the society's president, Mr Justice Williams, who said in the course of his opening address that:

> The object of the meeting is to demonstrate to Parliament that it is the wish of a large section of the community that public institutions, which are supported by public funds, should be conveniently and reasonably accessible to all classes of the community on that day which is called Sunday.

Mr G. D. Carter, M.L.A. moved, at this meeting, the following resolution:

> That our national institutions having been established, and being maintained out of the public revenue for the benefit of the whole community should be opened at such times as will suit the convenience and convictions of all classes and . . . this meeting is of the opinion that the Sunday opening of the Victorian Public Library, Museum and Art Gallery is demanded on the grounds of public welfare.[40]

The Hon. Edward Langton, Vice-President of the Board of Trustees of the Institution, supported the motion which was carried. Langton said that when he discovered, seven years earlier, that the Trustees had power to open the Institution on Sundays he succeeded in having a motion carried to that effect. The result was that during six Sundays in May and June 1883, when the Institution was opened on Sundays, the numbers who visited it were greater than any hitherto known. Langton explained that there would be no difficulty on the part of the Trustees in opening the Institution on Sundays nor need any alarm be sounded on this occasion as far as the attendants themselves were concerned.

Another speaker at this meeting was Alexander Sutherland, M.A., a school-teacher, historian and journalist. He said he believed that seventeen of the twenty Trustees of the Institution were in favour of "Sunday opening"; that prejudice alone stood in the way of adopting this practice and that it would have to give way to public demand.

The meeting that evening decided that copies of its resolutions be sent to the Premier, the Chief Secretary and the President of the Board of Trustees of the Public Library,

[39] Annual Report of the Trustees, 1893, p. 3.
[40] *The Argus*, 15 July 1890, p. 7.

the Museums, and the National Gallery of Victoria.[41] But before the Trustees had had time to consider these resolutions of the Victorian Sunday Liberation Society they had passed a motion introduced by Professor E. E. Morris, at their meeting on 22 July 1890, in favour of opening the Institution on Sundays, and they directed that it be communicated to the Chief Secretary. At the Trustees next meeting, on 29 July 1890, a letter was received from Mr Justice Williams. Attached to the letter were the resolutions of the Victorian Sunday Liberation Society which had been passed at its meeting a fortnight earlier. The Trustees directed that the letter be acknowledged and that a copy of its own resolution of the previous week on the subject be sent to Mr Justice Williams.

Supporting operations in this campaign were then conducted in Parliament. In the Legislative Assembly, on 3 September 1890, the member for East Melbourne, Frank Stuart, introduced a bill to provide for the taking of a poll among the inhabitants of the City of Melbourne and its adjacent suburbs to decide whether or not the Industrial and Technological Museum etc., should open on Sundays. But the bill came to nothing and on 17 December 1890, it was "discharged". Meanwhile, on the 23 September 1890, another attempt was made of a different character during a debate on supply. Captain C. F. Taylor, the member for Hawthorn, moved an addition to the motion on the Vote for the Public Library, the Museums, and the National Gallery to the effect that the Trustees be obliged to open the Institution on Sunday afternoons. After a short debate the motion was defeated by 54 votes to 13. Then, on 15 October 1890, L. L. Smith, who was the member for Mornington, moved a motion to the effect that the Industrial and Technological Museum etc. be opened to the public on Sundays. But again the motion was defeated, by 37 to 23. The advocates of "Sunday opening" were ahead of their time; they had to combine patience with tenacity and some years of campaigning still lay ahead before they were to attain their object.

At this time the Museum was concerned with another matter of an entirely different kind, and of considerable technical interest. A Royal Commission was appointed on 15 July 1889, to investigate and report on the best means for developing Victoria's coal industry, and the Museum's Director, Newbery, appeared before it as an expert witness. The Commissioners gave much attention to Victoria's brown-coal deposits, noting in their first progress report[42] that although their existence had been known for more than twenty years brown coal had, nevertheless, "remained a secret so far as its economic application to manufacturing or domestic purposes" was concerned. The Commissioners went on to express the view that:

[41] A leader in *The Age* on 15 July 1890 began by saying: "No grander demonstration of public enthusiasm and determination has been witnessed in this city than was made at the Town Hall last night in support of the programme of the *Sunday Liberation Society*. The fact is rendered the more noteworthy because it was achieved in defiance of the insidious tactics adopted by the clerical opponents of the movement for the opening of the National Institutions on the Sunday afternoons."

[42] *V.P.P.*, 1890, Vol. 4, No. 168, Royal Commission on Coal. First Progress Report of the Royal Commission appointed to inquire as to the best means of Developing and Promoting the Coal Industry of Victoria.

> There appears to be in this colony a great want of knowledge of the proper mode of burning the brown coal to advantage, and few persons are found skilled in its use.
>
> Your Commissioners have under consideration at the present time the propriety of recommending that an expert from Victoria be sent to other countries where this class of fuel is largely consumed with a view of ascertaining the best methods adopted of applying to it domestic, manufacturing, and other purposes, and the most approved mechanical contrivances employed in its utilisation.

The Commissioners made a firm recommendation, in their second and final report dated 9 December 1890,[43] that it was necessary for the government of Victoria to obtain the latest information on the methods employed in Europe and elsewhere for manufacturing and utilising brown coal; that if the brown coal industry in Victoria was to be placed on a sound basis to enable it to compete successfully with Newcastle coal it was imperative that a "qualified gentleman" be despatched at once to Europe for the purpose of acquainting himself with and reporting on the methods employed in Germany and other countries for raising and sending the coal to market, manufacturing the raw material into briquettes,[44] the use of the briquettes as a locomotive fuel, as a domestic fuel and for use generally as fuel in the industrial arts. The Commissioners also believed that it was essential that a sufficient quantity of Victoria's brown coal be obtained from different mines and sent to Europe in charge of the expert who was selected to go there; and that briquettes be manufactured from this Victorian brown coal by proper machinery, and under the supervision of experts, in order to determine their market value as compared with the best German briquettes and with Newcastle coal.

The "qualified gentleman" selected by the government of Victoria for this overseas work was the Director of the Industrial and Technological Museum, James Cosmo Newbery. At their meeting on 21 May 1891 the Trustees granted him six months leave to visit Europe on behalf of the Department of Mines of Victoria.[45] There he was to study Germany's brown coal industry,[46] to investigate its methods of manufacturing briquettes, and, as an additional assignment, to examine the best methods for treating refractory ores.[47]

Newbery sailed from Melbourne on 17 June 1891,[48] travelling by way of New

[43] *V.P.P.* 1890, Vol. 4, No. 213 Royal Commission on Coal. Second Progress Report, dated 9 Dec. 1890.

[44] Briquetting, as an organised industry, began in Germany in 1872; by the end of 1884 that country had 120 briquetting presses in operation with an annual output of over 1,000,000 tons of briquettes (ibid p. 11).

[45] At this same meeting the Trustees appointed O. R. Rule to be the Acting Director of the Museum during Newbery's absence.

[46] Newbery had twenty tons of Victoria's brown coal sent to him in Germany. This quantity was made up of samples obtained at Morwell, Yarragon, Mirboo and Lal Lal; in Germany these samples were made into briquettes under experimental conditions. See *The Australasian*, 13 June 1891, p. 1129.

[47] Tailings were obtained from Bendigo, Bourke's Flat and St. Arnaud and sludge was obtained from the Madame Berry Mine; five tons were taken in each case and these quantities were sent to Newbery in Europe (Ibid).

[48] *The Argus*, 17 June 1891, p. 5.

Zealand and Cape Horn; he visited England, Scotland, Belgium, Northern and Southern Germany and Italy. He inspected mining areas, ore-reducing works, brown-coal fields and briquetting plants, and in the course of these inspections he had discussions with some of Europe's leading mining engineers and briquette manufacturers. At an early stage in these investigations Newbery's attention was attracted by the Lührig process for the treatment of refractory ores and his investigations into this process produced very satisfactory results.[49]

In Germany Newbery visited brown coal fields in Berlin, Hamburg, Leipzig, Zeitz and a number of other places in the vicinity of these cities. Later he returned to London to write up his notes. He then returned to Germany and continued his investigations in the neighbourhood of Magdeburg.

After completing his official business in Europe, Newbery sailed from London on 15 January 1892 and landed in Melbourne on 25 February 1892,[50] after an absence of eight months. During his investigations in Europe he had acquired much information of value to the Museum and to the Department of Mines about the processing of brown coal. He had acquainted himself with the latest methods of manufacturing briquettes and he brought back with him plans for the erection of a briquetting plant in Victoria. He believed that brown coal could take the place of other domestic fuels if it could be produced at a suitable retail price. In Berlin the retail price of briquettes at that time was said to have been £1 per ton and this price enabled briquettes to compete successfully on the retail market with black coal as a domestic fuel.[51] In the course of a press interview after his return to Melbourne,[52] Newbery spoke highly of the Lührig process which he believed would be a means of increasing considerably the profits from gold mining in Victoria. He said that by that process "concentrates from 3 oz. per ton become as marketable as wool or wheat", and that Mr Lührig declared that he could separate anything that had a greater difference in gravity than 0.5. Newbery then cautiously added: "I have not seen him do it, but that is what he says he can do." When questioned about the manufacture of briquettes Newbery said:

> In Germany the average lignite contains from 50 to 60 per cent of water. That is about the same as our own lignite when it is wet. It takes as nearly as possible two tons of wet lignite to produce one ton of briquettes—sometimes it is a little more than two tons. In regard to quality our coal is a little better, having less ash. The German briquette works are increasing very rapidly. The present production of briquettes is about 6,000,000 tons per year. They form the favourite domestic fuel and the whole of this 6,000,000 tons is used for that purpose.

Newbery's concluding remarks at this press interview were:

> I confess I am not nearly so sanguine with regard to the manufacture of coal briquettes in the colony as the adoption of the Lührig gold-saving process. The

[49] For further information of the Lührig process see *The Australasian*, 27 Feb. 1892, p. 414. See also T. Kirke Rose, *The Metallurgy of Gold* (Charles Griffin & Co., London, 1906), pp. 183 and 257.
[50] *The Argus*, 26 Feb. 1892, p. 3.
[51] *The Argus*, 22 Feb. 1892, p. 5.
[52] *The Argus*, 27 Feb. 1892, p. 9.

question of carriage is a most important one. If you bring truckloads of briquettes from Gippsland, what are you going to fill your trucks with going back there? It will cost as much to run them empty as full.

His pessimism was justified. The large-scale production of briquettes in Victoria did not become a reality until the State Electricity Commission produced them in marketable quantities about thirty years after Newbery's death. They were only produced then after a further study of Germany's brown coal industry and its briquetting methods had been made by the State Electricity Commission. Newbery's report on the brown coal industry in Germany was published by the Department of Mines in 1892.[53] Today it is an essential document for any study of Victoria's development of its brown coal industry and its production of briquettes.

The year 1892 also marked the beginning of an era of retrenchment, following upon the years of extravagance in the colony of Victoria known as the "boom" period, and early in the year the Trustees were instructed by the government to retrench in every possible way.

The officer-in-charge of the Museum's mineral collections, O. R. Rule, who had been a permanent public servant since May 1878, resigned his position in the Museum in April 1892. The reason for this resignation, it was said in the annual report of the Trustees for 1892, was "ill health". It is therefore ironical to have to record in this instance that Rule lived for another 34 years and died at the age of 91. Rule's resignation created a vacancy which had to be filled, and it was filled in probably an unexpected way.

Professor Ulrich of New Zealand, who had been on the staff of the Museum in the 1870's, wrote to his former Director in the Museum, Newbery, and informed him that he could nominate one of his students, named Walcott, for the position vacated by Rule. Newbery, in a minute to the Trustees dated 4 July 1892 said: "Professor Ulrich strongly recommends Mr Walcott in a private letter and, as I know no one else to take the position, I would suggest that Mr Walcott should be appointed on probation."

Walcott was a New Zealander, 22 years of age and, at the time of his application for the position, was a student of the Otago University's School of Mines. He set out his academic qualifications in this application, the text of which is as follows:

London Street,
DUNEDIN
16th June, 1892

The Chairman,
Trustees of Public Library, Museum and Art Gallery,
Melbourne

Sir,

Professor Ulrich having informed me of Mr Rule's resignation as Mineralogist and Curator to the Museum I beg to offer myself for the vacant post.

[53] J. Cosmo Newbery, *Report on the Brown Coal Industry in Germany* (Department of Mines, Victoria, 1892), pp. 11 + drawings. No. 2961A.

I am a student of the Otago University School of Mines now in my fourth year. At the conclusion of the third year I obtained the distinction of "Associate of the Otago School of Mines".

This year I am attending simply from a love of it, and a desire to improve my knowledge, having passed the necessary examinations in the following subjects:

Mathematics	Practical Mechanics
General Geology	Theoretical Physics
Mining Geology	Practical Physics
Theoretical Chemistry	Mineralogy
Practical Chemistry	Petrography
Theoretical Mechanics	Mining 2 courses
Drawing	Mine and Land Surveying
Use of the Blowpipe	Assaying
Determinative Mineralogy	

The Diplomas of the Associateship being not yet to hand I enclose copy of a declaration by the Chairman of the Professorial Board to the effect that I am entitled to that Diploma.

I obtained first place in the examination on Mineralogy, Petrography, and the use of the Blowpipe. Professor Ulrich has been good enough to mention my qualifications in a letter to Mr Newbery. I also hold testimonials from Professor Black, Professor of Chemistry, and Mr Wilkinson, Lecturer on Metallurgy and Assaying, copies of which I enclose. Also one from Mr W. L. Simpson, chairman of the Mining and Metallurgical Committee of the late "New Zealand and South Seas Exhibition" at which exhibition I was assistant in charge and also assistant assayer to the New Zealand Mineral Court.

I have the honour to be
Yours obediently,

Richard H. Walcott

Walcott subsequently took up duty, on 5 January 1893, as Mineralogist in the Museum and he was employed "outside the Public Service Act".

On 1 May 1895, a little more than three years after Walcott's appointment to the staff of the Industrial and Technological Museum, its Director, James Cosmo Newbery died at St Kilda at the early age of 52 years, his health having been permanently affected by the serious internal injuries which he had suffered in the Windsor railway collision in 1887. He had been the Director of the Museum since its inception twenty-five years earlier. Newbery was the most accessible of men. The humblest of mining prospectors or the smallest of mining investors could always be sure of a kindly hearing and sound advice; he made his knowledge available to all who wanted it without thought of personal recompense. His scientific achievements had conferred much prestige on the Museum; they had made him invaluable to the Department of Mines of Victoria, and his work was also bound up with the development of Australia's mining industry.[54]

[54] For a short biographical sketch of James Cosmo Newbery and a list of his published reports see Bulletin No. 23 (1910) of the Geological Survey of Victoria—Biographical Sketches of the Founders of the Geological Survey of Victoria (Department of Mines), pp. 47-8.

As permanent head of the Museum, Newbery had enjoyed the right of private practice as an analyst. This arrangement was advantageous alike to the Museum and to himself. He was able to keep in touch with the practice of his profession as a chemist and to keep up-to-date with developments in it. These advantages were reflected in his professional and administrative work in the Museum. No board of inquiry in Victoria, and sometimes elsewhere, whether it dealt with sludge, coal, noxious fumes or explosives was complete without him. When the Board of Directors of the famous Mount Morgan Gold Mining Co. in Queensland was faced with the problem of making large bodies of its refractory ores pay it applied to him for assistance. The result was the patenting by him, in conjunction with Claude Vautin, of the "Newbery-Vautin Process of Gold Extraction".[55] The application of the methods of this process to the old chlorine process was so successful at Mount Morgan that the company was floated into a public company, The Mount Morgan Gold Mining Co. Ltd.[56]

The Trustees placed on record that:

> The death of Mr Cosmo Newbery, for many years Superintendent, was one of the greatest misfortunes the Museum could have sustained. To his knowledge and zealous endeavours its formation and development are mainly due, and the Trustees are very sensible of the value of his services and of the loss they have sustained by his death.[57]

James Cosmo Newbery is commemorated in the Institute today by a marble bust executed by Percival Ball.[58] It was presented to the Trustees at a ceremony at the Museum on 27 February 1896, by the Chief Justice of Victoria, the Hon. Sir John Madden, on behalf of Newbery's friends and admirers who had subscribed to meet its cost. Sir John Madden, in formally handing it over, reminded those present that:

> This gathering has been formed to thank the Trustees for the kind and sympathetic attitude which induced them to accept the bust of this most admirable man in order that it might be placed in the scene of his labour, in the Museum which he might be said to have initiated himself and which he carried on so admirably for a number of years. It will perpetuate the features of Mr Newbery in the midst of his work, and be an example for those who come after him. He will be remembered not only for his learning but for the delightful nature and disposition which made his teaching a pleasure at all times. Old students will come to the museum and see their old master and will recall old times with delight, mingled with regret, that he has gone.

The bust was accepted on behalf of the Trustees by their President, the Hon. Sir George Verdon. In accepting it, he said:

[55] The Mount Morgan Gold Mining Co. Ltd was registered in the Supreme Court of Queensland at Brisbane on 1 Oct. 1886. See Rees Rutland Jones, *Gold Mining in Central Queensland and the Mount Morgan Mine* (printed by *The Morning Bulletin*, Rockhampton, 1913), p. 15.

[56] For an explanation of "The Newberry-Vautin Process" see *The Australian Mining Standard*, 8 Oct. 1890, p. 20.

[57] Annual Report of the Trustees, 1895, p. 5.

[58] *The Illustrated Australian News*, 1 Feb. 1896, p. 4.

> Those who know what services Mr Newbery rendered to the community know that he deserves this honour. He practically created the Museum; he worked in it for years; and he gave his great ability and learning for the benefit of the public, so that no inventor or miner visited the Museum without learning something that might perhaps be of infinite value . . . Mr Newbery's bust will remain a perpetual memorial in the scene of his work . . . so that visitors will know that he was one of the founders of this admirable Museum, and one of the early representatives of science in a community which for the most part has of necessity been given to more material things. He will be remembered for all time as a good and faithful servant of the public.[59]

The subscribers had asked that the bust of James Cosmo Newbery be placed in a prominent place in the Museum.[60] This wish was acceded to at the time, but a few years later the bust was relegated to a basement store. The emotional fervour inspired by the occasion of its acceptance had passed, and it remained in store for nearly seventy years as a reminder of an obligation solemnly undertaken but all too soon thereafter lightly set aside. It remained for the present Director, Mr Fowler, to restore the bust of James Cosmo Newbery to a place of honour in the Institute in which he had worked and served the public so well. Today, this bust may be seen by visitors and staff alike.

[59] *The Argus*, 28 Feb. 1896, p. 5.
[60] *Ibid*, p. 5.

Chapter 4

Early Years of the Walcott Era (1895-1900)

Walcott,[1] the Museum's Mineralogist, succeeded Newbery.[2] The Trustees recorded that he was "well qualified for the work" and that he had "been appointed to fill Mr Newbery's place".[3] However, Walcott's position differed in some respects from that occupied previously by Newbery. The title of the position was changed from Superintendent to Curator and this may well have reflected some change in the status of the position. Walcott took up duty in his new appointment in times of great financial stringency.[4] Unemployment was widespread and the Trustees had been directed by the government to reduce expenditure by retrenchment and other means. Walcott was appointed "Acting Curator" and he bore this title for about five years. Like his predecessor, he was employed, during these years, outside the provisions of the Public Service Act. Then, in May 1900, he became a permanent officer of the Public Service of Victoria and his title was changed from "Acting Curator" to "Curator".[5]

The year after Walcott's appointment to the Museum's senior professional and administrative position, the President of the Board of Trustees, the Hon. Sir George Verdon, died. He had been a trustee since 4 June 1872 and President since 30 April 1883. He died on the 12 September 1896, and in the following month, on 22 October 1896, the Board of Trustees elected the Hon. Edward Langton[6] to the position of President and Professor E. E. Morris was elected to succeed him in the position of Vice-President.

[1] Richard Henry Walcott, F.G.S. Born 30 Sept. 1870 at Dunedin, New Zealand. Acting Curator of the Industrial and Technological Museum from 2 May 1895 to 13 May 1900. Curator of the Industrial and Technological Museum of Victoria from 14 May 1900 to 30 Sept. 1935. Died 9 Oct. 1936.

[2] The official date of succession was, it has been presumed, 2 May 1895.

[3] Annual Report of the Trustees, 1895, p. 5.

[4] The financial facts of Walcott's appointment were: the appointment of Superintendent (with a salary of £273 p.a.) was abolished when Newberry died; Walcott's position of Mineralogist (with a salary of £250 p.a.) was combined with that of Curator to become Curator and Mineralogist, but without any additional salary.

[5] Henceforth, for convenience, the Curator will be referred to in this work as the Director.

[6] The Hon. Edward Langton. Minister of State, company director and accountant. Born 2 Jan. 1828 at Gravesend, England. President of the Board of Trustees of the Public Library, Museums and National Gallery of Victoria from 22 Oct. 1896 to 5 Oct. 1905. Died 5 Oct. 1905 at Toorak, Victoria.

Langton had been a Trustee since 11 May 1874. He had been an active member of the Victorian Parliament, was noted for his keenness and his logical but incisive speeches in the House, and was known for his unyielding manner in defending principles in which he believed. He was a prominent advocate, as we have already seen, of the opening of the Museum on Sundays and he had taken a leading part in the movement which began in 1883 in its favour. He lived to see the Sunday opening principle approved by Parliament more than twenty years later.

The Acting Curator took the opportunity to inform the Trustees in 1897 that 1,098 specimens and objects had been received during that year; that "It was unfortunate that we are dependent upon the liberality of the public for specimens, as it is impossible in this way to prepare instructive and representative collections"; and that "it would be much more advantageous if facilities were afforded for collecting direct for the Museum." The Museum was, in fact, crowded with a number of unsuitable exhibits—a direct result of building collections with donations. It was decided to dispose of these in order to make room for exhibits of a more desirable character. Some were accordingly presented to the Working Men's College, some were sold. It was also decided that the owners of all exhibits lent to the Museum should be asked either to present them or to take them away. This decision was not made with the intention of refusing suitable loans in future. It was made solely to prevent the Museum being used for advertising or storage purposes. The basement was also carefully gone through and all useless and worthless material, which had been accumulating there for years past, was removed from the building.

The question of adequate financial provision by the government for the maintenance and development of the Museum was one of long standing and had tested the patience of the Committee of the Museum in every conceivable way. Other branches of the Institution were similarly affected. In an attempt to remedy the situation the Trustees called on the Chief Secretary, the Hon. A. J. Peacock, and the Treasurer, Sir George Turner, on 19 May 1898. They made a strong appeal for sufficient means to carry on the Institution in a satisfactory manner.

In the minute book of the Board of Trustees a record was made of the proceedings at this deputation in so far as they affected the Institution. There were summaries of what the President, the Hon. Edward Langton, the Vice-President, Professor E. E. Morris, and three other Trustees said. The President detailed the many difficulties which the Trustees had encountered in trying to keep within the limits of the reduced estimates of the past few years. In every branch of the Institution, he said, rigid economy was being practised and every branch was suffering from the effects of frequent demands for retrenchment. He made a comparison too, between the grants made in Sydney and Melbourne for the maintenance of the national libraries, museums, and art galleries, and he pointed out that £140,000 had been spent in Sydney in the last five years as against £70,000 in Melbourne.

The recorded remarks of these Trustees at the deputation show that specific references were made by them to the Public Library, the National Gallery and the National Museum, but no specific reference was made in their petition to the problems of the

Industrial and Technological Museum. If its problems were not to be presented to the Minister by the Trustees then by what other official means, one could ask, was he to learn about them?

The Premier and Treasurer, the Hon. Sir George Turner, assured the Trustees of his sympathy; but he pointed out that there were difficulties which prevented compliance with their request. The Museum's Estimates for the year 1898-99 provided only £150 for the purchase of cases, chemicals and fittings, for incidental expenses, specimens and stores. Yet even this figure was an improvement on what it had been in the immediate past! The Acting Curator had pointed out, only in March 1898, that: "The Museum vote of £50 is quite inadequate to keep the place up to modern requirements, and it is not even sufficient to provide proper accommodation for the specimens we have in hand".[7]

An item of interest in the Acting Curator's report for 1897 concerned the purchase of a typewriter, which he said "has permitted a marked improvement in the uniformity and neatness of our labels".[8] This was probably the first typewriter purchased for the Museum but not for the Institution. At the meeting of the Board of Trustees eight years earlier, on 27 June 1889, it had been decided, on the motion of R. E. Wallen,[9] that "a typewriter be got for the use of the officers".[10] It is presumed that this resolution meant that the typewriter was for the common use of all branches of the Institution.

The typewriter in its modern commercial form may be said to date from 1 March 1873. On that date E. Remington & Sons signed a contract to manufacture a machine that had been invented in 1868 by three men, Sholes, Glidden and Soulé.

Many inventors during the preceding half-century had produced experimental machines quite as meritorious as the crude machine which formed the early efforts of the group associated with Sholes. But the circumstance which rendered the efforts of these early experimentalists abortive was that the time was not ripe for the invention. Many of the early devices were primarily intended to permit those suffering from blindness to read and to write, so speed was not an important factor. It was not until the machine was able to surpass the pen in speed that its possibilities began to be appreciated. This speed factor was the chief reason for replacing the pen with a machine usually costing over £20. Legibility was a secondary though important consideration, and, until the business world realised that the use of shorthand in taking dictation, coupled with the use of the typewriter, freed busy men from the drudgery of the pen, the typewriter remained an interesting novelty. By 1873, when

[7] The Annual Report of the Trustees, 1897, p. 23.

[8] Ibid, p. 23.

[9] For a biographical sketch of Robert Elias Wallen J.P. (1831-93), see *The Australian Mining Standard*, 16 July 1890, p. 15.

[10] The name of this typewriter has not been discovered. Although the information is not necessarily related it may be noted in this connection that in the Curator's report for 1921 he referred to a donation of "historical" as well as of technical interest—"a Hall *Index* typewriter obtained for the Museum by Mr D. J. Gilchrist. This machine was patented in 1881, and was the first kind of typewriter used commercially in Australia".

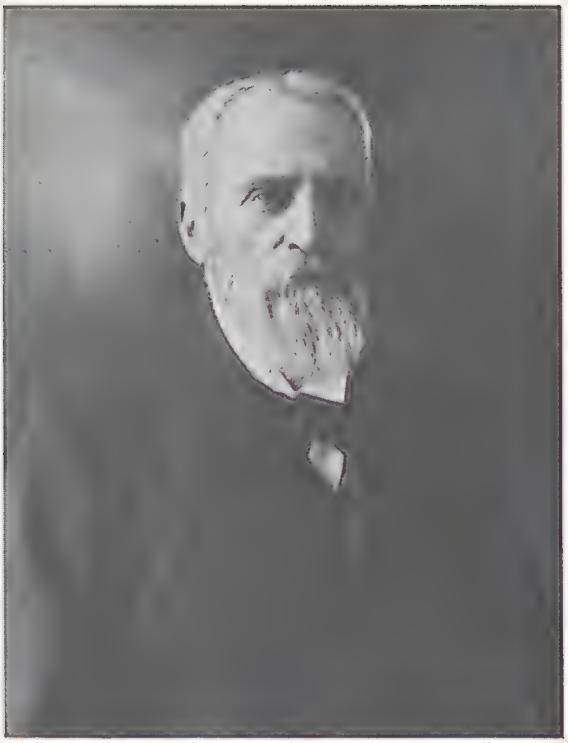


PLATE 14. The Honourable Edward Langton.
President of the Trustees of the Public Library, Museums and National Gallery of Victoria, 1896-1905.

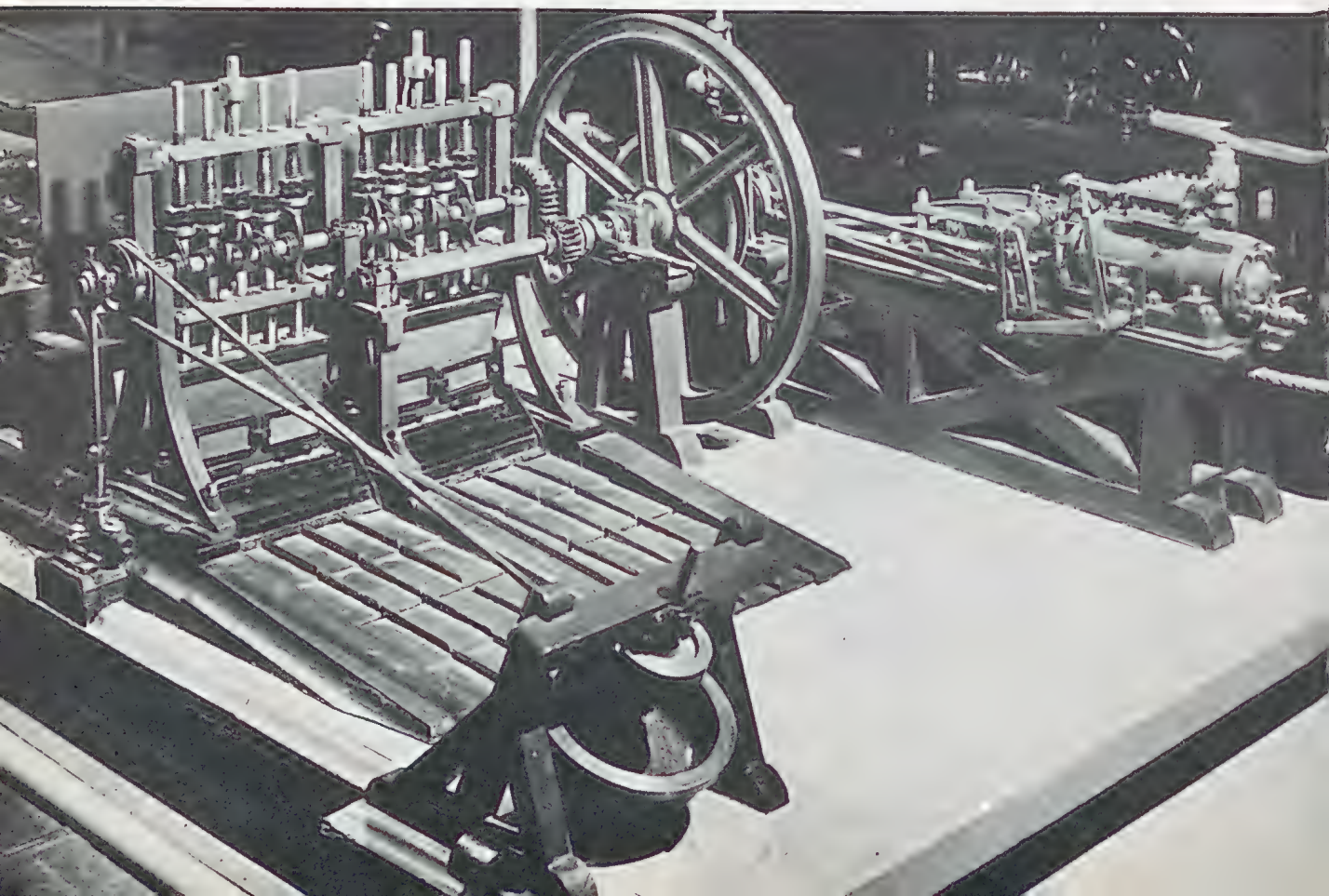
PLATE 15. The Honourable George Swinburne.
President of the Trustees of the Public Library, Museums and National Gallery of Victoria, 1928.

PLATE 16. Colonel John Monash.
Leader of a committee responsible for the re-opening of the Museum in 1915.

PLATE 17. Hugh Victor McKay.
An Australian pioneer manufacturer of agricultural machinery. A benefactor of the Museum.

PLATE 18. The Clunes and Port Phillip Mining Company. A contemporary model of works at Clunes in 1858.

PLATE 19. A stamper battery. A visitor-operated working model.



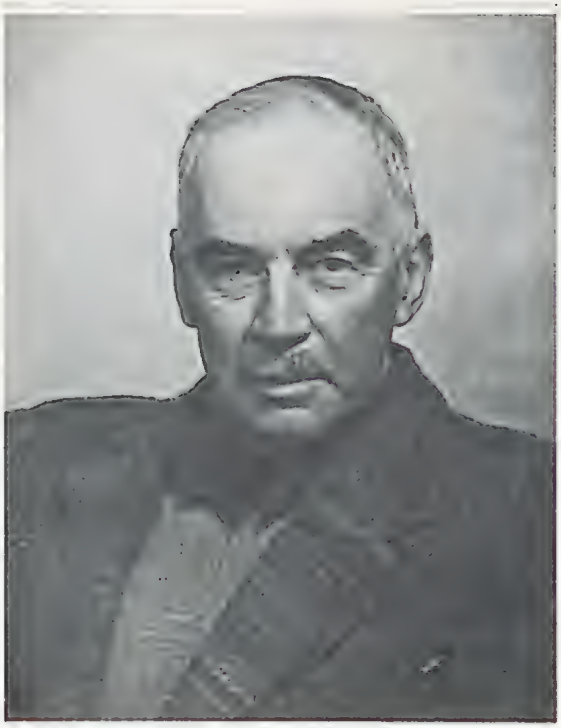


PLATE 20. Sir Wilfrid Russell Grimwade.
Chairman of Trustees of the National Museums,
1945-50.

PLATE 21. Colonel Sir Fred Garner Thorpe.
Trustee 1945-68. Chairman 1950-54, 1963-65.

PLATE 22. Sir Walter Eric Bassett.
Trustee 1950-64. Chairman, 1954-57.

PLATE 23. Oliver Emanuel Nilsson.
Trustee 1947-68. Chairman 1957-58.

PLATE 24. Portion of the Museum's gold display on the Victorian Centenary train, 1951.

PLATE 25. Diorama of the NA Class (Puffing Billy) railway.

PLATE 26. Frederick John Edgar Kendall.
Member of the staff since 1952.
Deputy Director since 1962.

PLATE 27. William George Herbert Tregear.
Honorary Curator of Astronomy since 1966.

PLATE 28. Part of the Museum's observatory at the Domain where regular public demonstrations are given.

PLATE 29. The Museum's 8-inch refracting telescope is serviced by Mr. M. E. Hancock, Technician.

PLATE 30. A large scale model of the housefly (Musca domestica) shows graphically its disease carrying potential.

Advanced modelling techniques assist the public to understand biology.

PLATE 31. A greatly enlarged section of vine leaf infected with Downy Mildew (Plasmopara viticola).

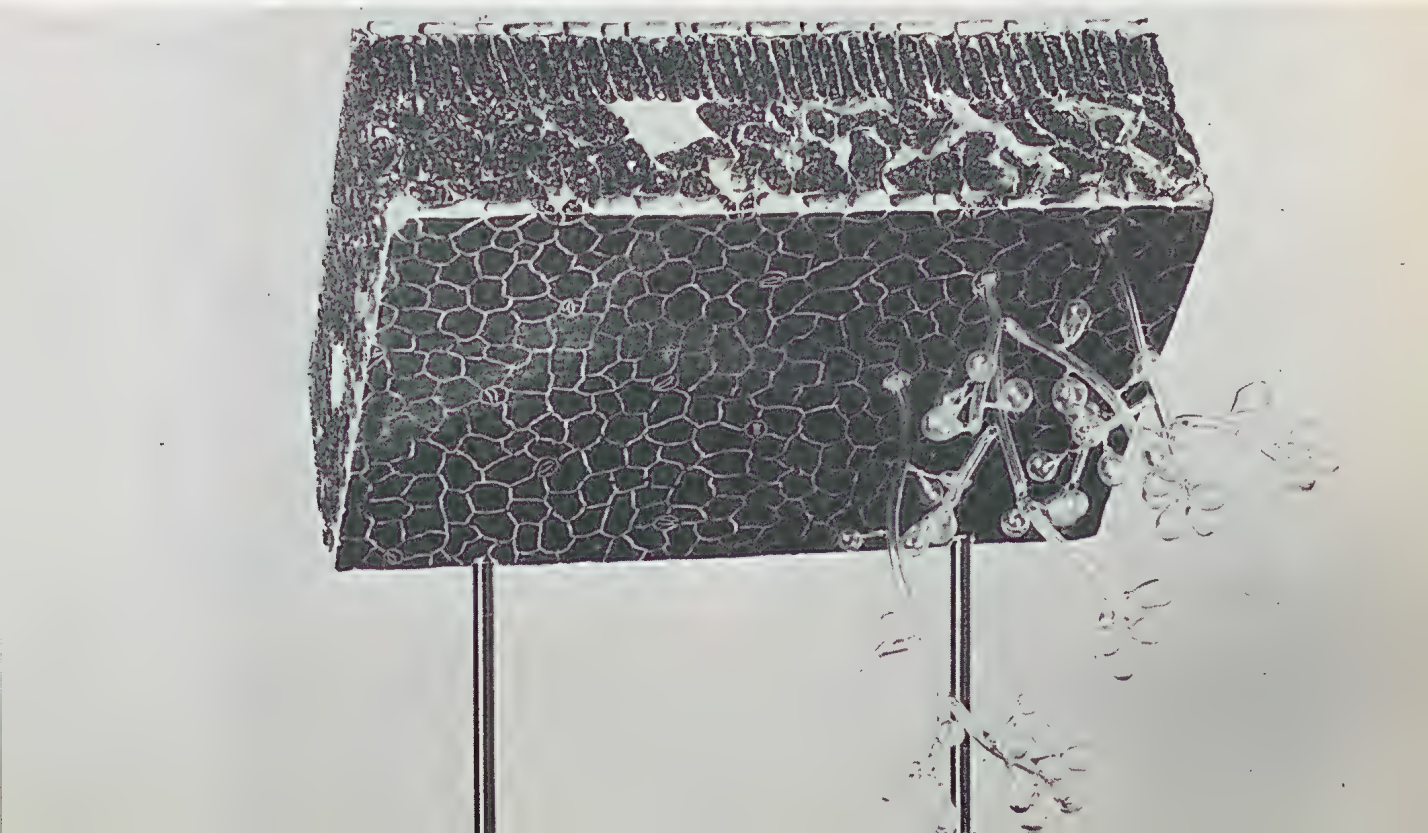


PLATE 32. Richard Henry Walcott.
Curator of the Museum, 1895-1935.

PLATE 33. Leonard Royce Ninnis.
Curator of the Museum, 1935-36.

PLATE 34. Edgar Howard Penrose.
Curator, 1936-45,
and Director of the Museum, 1945-50.

PLATE 35. Charles Melbourne Focken,
Director of the Museum, 1951-61.

Sholes had completed his experimental work, the time was not quite ripe, and the Remington Co. found it a hard task to interest the public. Even when the typewriter made its first serious appearance in public, at the Centennial Exposition in Philadelphia in 1876, it attracted but little attention, whereas the Graham Bell telephone, also exhibited there, created world-wide interest. In those early years one group of salesmen after another failed to interest the public. In 1881, for instance, the Remington Co. disposed of only 1,200 machines during the year. The turning point came in 1882 when the well-known firm of Wyckoff, Seamans & Benedict was formed to take over the selling agency for the whole world. This firm purchased the Remington interests in 1886.[11]

Since these early years of the typewriter as an office machine, the Museum's collection has gradually grown into the large and varied one that it is today. It shows clearly the typewriter's development from the time when it was regarded as an expensive novelty until today when, although still an expensive item, it is regarded as indispensable in offices of all sizes.

Prior to 1899 repeated requests had been made by the Director of the National Museum, Professor McCoy, that its building, located in the grounds of the University of Melbourne, be extended. At their meeting on 27 April 1899, the Trustees considered a letter from the Chief Secretary's Department which forwarded plans for the proposed extensions to this building, and they decided to refer them to the Committee of the National Museum for consideration and report. During the Committee's consideration of them, Professor McCoy died, aged 82 years on 13 May 1899.

At their meeting on the 1 June 1899, the Trustees decided that "the contents of the National Museum" should be moved from its building at the University of Melbourne to the Public Library building in the city; that application should be made for the approval of the Governor-in-Council for this action to be taken; that a report[12] by Professor Spencer[13] on the National Museum be adopted, and that Professor Spencer be appointed Honorary Director of the Museum in place of the late Professor McCoy who was a salaried officer in the appointment.

Two days later *The Age* published a long feature article entitled "The National Museum"[14] which dealt at some length with Professor Spencer's report and his comments on the Industrial and Technological Museum. In one part this article said:

> The question to be considered at this juncture is as to the provision which should be made for housing the exhibits at the Public Library. Professor Spencer, chairman of the National Museum committee, has dealt with this subject in a special report, which was published in these columns yesterday. He is of opinion

[11] G. T. Richards, *The History and Development of Typewriters*. (H.M.S.O., London, 1938), pp. 6-7.

[12] For text of Professor Spencer's report on the plans etc. of the National Museum, see *The Age*, 2 June 1899, p. 6.

[13] Later Emeritus Professor Sir (Walter) Baldwin Spencer, K.C.M.G., M.A., D.Sc. Litt.D., F.R.S. Born 23 June 1860. Honorary Director of the National Museum of Victoria from 27 July 1899 to 18 Dec. 1928. Died 14 July 1929.

[14] *The Age*, 3 June, 1899, p. 10.

> that there are two alternatives—(1) the erection of a completely new building, or (2) the appropriation of some part of the present buildings on the Public Library site, together with the erection of buildings contiguous to them for work-rooms, reserve storerooms, and rooms for the staff. He points out that apparently the only way in which this latter alternative can be given effect to is to appropriate what is called the new Technological Museum as a main exhibition hall for the natural history collection, and to erect other buildings, suitable for the provision of the rooms mentioned, along the Russell-street frontage. The whole of this frontage, he thinks, would be required, and if the auxiliary buildings were of brick the expense would not present an insuperable difficulty. The Russell-street site was actually re-purchased from the Mechanics' Institute many years ago for £5000, and the Trustees of the Public Library hold a conveyance of the allotment for the specific purposes of a national museum. The present so called "technical" collection is of very little use, and it can be made serviceable only by the expenditure of a considerable sum of money on appliances, and in providing laboratories and workrooms and a sufficient staff. Professor Spencer holds also that part of the present collection housed at the Exhibition Hall—the mineralogical collection—ought really to be associated with the Natural History Museum. He also makes a number of suggestions with regard to the staff requisite under the new arrangement.

This feature article drew the fire of an advocate for the maintenance of the Industrial and Technological Museum; he wrote a letter to the Editor of *The Age* which he signed "Oregan" and in which he said:

> Instead of it being only a question of location it seems, from Professor Spencer's report, that the technical museum is to be appropriated for a pure natural history museum, and the former collection abolished. If, as stated, the technical collection is of little use, and can only be made effective by the expenditure of a considerable amount of money, why has it been allowed to fall into this condition and why should it not have as great a claim on the Government for a grant to remedy its defects as the natural history museum, which is of no practical value to the public. Surely an institution which has for its main object the promotion and welfare of local industries should not be cast aside because deficient in staff and appliances, and more especially when the subject of technical education is at present in the hands of a commission. Technical museums are to be found in nearly all large cities, and besides being valuable and necessary adjuncts to technical colleges, they disseminate practical information to the many engaged in mining, agriculture and other pursuits.[15]

Later that month the Industrial and Technological Museum experienced its "black day". At the Trustees' meeting on 29 June 1899 a letter was received from the Department of the Chief Secretary stating that the Governor-in-Council had approved of "the transfer of the National Museum Exhibits to the Public Library buildings". But the execution of this decision had calamitous consequences for the Industrial and Technological Museum. The accommodation allotted to the National Museum of Victoria in the Public Library building was that already occupied by the Industrial and Technological Museum. This Museum's mineralogical collections were trans-

[15] *The Age*, 7 June 1899, p. 7.

ferred to the National Museum. It was decided to find space for the best of the remainder of Industrial and Technological Museum's collections in a room to be built off the Verdon Gallery. Its unwanted exhibits were to be sold; and the remainder, for which no space could be found, were to be stored in the vaults.[16]

The old Industrial and Technological Museum building behind the Public Library, which had been formerly known as the Great Hall, was condemned by the Trustees as unsafe and as a danger, in the event of fire, to the whole building occupied by the Institution. It was accordingly decided to demolish the building and to rebuild temporary rooms at the north and south ends to accommodate as far as possible the contents of the Industrial and Technological Museum, after the Public Library's Lending Library Branch had been accommodated.

Later in that year, in October 1899, another attack was made in the press in defence of the Industrial and Technological Museum. It was launched with some vigour by the former Government Geologist of Victoria, R. A. F. Murray[17] who said, in a letter to the editor of *The Age*, headed "The Technological Museum: A Crying Scandal",[18] that:

> Not having for some time visited the Technological Museum at the Public Library, I was astounded recently on going through it to see the alterations that are being effected with respect to the geological and mineral collections, and as the matter is one of the highest importance from an educational point of view, no apology need be offered for bringing it under public notice.
>
> At the present time action is being taken to provide at the University such instruction in scientific mining, engineering and the cognate sciences of geology, mineralogy and metallurgy, as will fit students for a career in practical mining, which is now increasingly becoming an occupation offering rich prizes to the talented and efficient throughout Australasia and other parts of the world, and to facilitate the acquisition of the necessary knowledge the collections referred to offer, or did offer, a series of invaluable object lessons open to all. Truly a noble museum, instituted and brought to a high state of perfection through many years of unremitting care and industry, and the application of world-wide experience, by the late J. Cosmo Newbery, who, during the earlier stages of progress enjoyed the favouring auspices of the learned and broad-minded Sir Redmond Barry, the founder of the Public Library.
>
> Up to, and for some time after, the date of Mr Newbery's decease the collections were so arranged as to exhibit scientifically classified specimens of nearly all the rock formations, metals and minerals known in the world, with illustrative samples of their economic products in various stages of manufacture. The actual value of the collections would amount to many thousands of pounds, and their educational work would be incalculable. Further, during Mr Newbery's life time the services of himself and his assistants were always available to bona fide inquirers. Claiming, though in an indirect way, to have been to some extent a collaborateur with Mr Newbery and his staff, and sharing a justifiable pride in the magnificent museum that they had brought together, you can imagine my

[16] Annual Report of the Trustees 1900, p. 26.

[17] Reginald Augustus Frederick Murray. Born 18 Feb. 1846. Employed in the Geological Branch of the Department of Mines of Victoria from 1862 to 1897 when he retired. Died 5 Sept. 1925.

[18] *The Age*, 10 Oct. 1899, p. 7.

disgust at witnessing the changes recently made, which when previously described to me had seemed so incredible that nothing but personal investigation enforced belief.

The mineralogical, geological and metallurgical collections appear to have been removed and stowed or packed away in obscurity. The great hall at the back of the picture galleries, which once contained this collection, with the bust of Mr Newbery in the centre, was "closed by order of the Trustees", and from the little information obtainable it appears that this is to become the receptacle of the stuffed beasts brought down from the University collection, no provision being made for the exhibition of the more important mineralogical one.

Naturally little could be learned or reasonably asked from the paid officers of the establishment, who have no doubt to obey orders, but it seems as though the splendid and educationally valuable mining and mineral museum is to be subordinated to one of stuffed possums and other beasts of the field. That the study of the science of biology in common with all other branches of natural science, is one to be encouraged and supported by the State is not to be gainsaid, but that it should take precedence of the more practically important one of geological science generally is, to say the least of it, highly questionable.

Possibly the powers in charge of the museums consider that the wily stuffed possum, kangaroo or native bear, the pickled snake, the dried alligator, or the hairless lion and giraffe, may offer more attraction to the general public. No doubt they do, especially to the nurse girls, with their infant charges, who love to gaze on the "beestesses", but as a matter of practical scientific education how does this exhibit compare with that which has been relegated into obscurity to make room for it? If the authorities simply wish to attract numbers why not establish a wax work exhibition like Artemus Ward's, with "Moral wax staboots of celebrated piruts and 'murderers'?" That the collections of all kinds stored in the Museum at the University should be brought to the one central museum in the Public Library grounds is most desirable, and was mooted many years ago, but not with the idea that those collections bearing on the important mining industry should give place to stuffed animals, birds, and reptiles, however suave in their demeanor.

It would be interesting also to ascertain how the Government vote for the Technological Museum has been so applied as to render the substitution above described legal, and it would be still more so to know who are the persons directly responsible for the alterations complained of, whether trustees or officials. Abandoning banter, I take on myself to bring against the responsible authorities, whoever they may be, of the Public Library, Technological Museums, the charge of imbecile incompetency as regards the management of the sections particularly appertaining to the mining industry, i.e., the geological, mineralogical and metallurgical exhibits, and, careless whom I may offend, invite the attention of the Legislature, the press and the general mining public to the subject. Ignorance may be the excuse for this scandal, but if so, why allow the ignorant the power to wreck so valuable a public property.

Much more might be said, but this letter has become too lengthy. It can be added, however, that in a room, "Closed by order of the Trustees," which I entered without leave, I found, amidst a heterogeneous collection of more or less obsolete machinery models, packed anyhow, the bust of Mr Newbery, the founder of the Museum, presented by his friends to the institution, and at first accorded in the presence of representative citizens of Melbourne, under the auspices of Sir John Madden, an honoured place in the Museum. The authorities who have

allowed this desecration to take place may have souls above buttons, but the buttons must be very small ones.[19]

On 11 October 1899, *The Age* published the following reply to Mr Murray's letter by the Honorary Director of the National Museum, Professor Baldwin Spencer:

> It is to be regretted that Mr Murray, before writing the letter which appears in your issue of today, did not make inquiries from some responsible officer with regard to the mineralogical and geological collections at the Public Library. Had he done so he would have learned that, so far from no provision being made for their exhibition, the new museum is designed so as to allow of ample room for these collections, and also for work rooms and laboratories, such as have not hitherto been in existence, though much needed, for practical work. He would have learned further that the fine mineralogical and geological collection already at the Public Library has been augmented by the addition of the extensive series of specimens until recently housed in the Museum at the University, and that, in addition to the previous curator, there is to be a second scientific assistant appointed to deal with this department.
>
> Everything of value in the old museum has been retained—not a mineral or geological specimen has been, or is likely to be, destroyed. An ample illustrative series will be on public view, while the remainder will be carefully arranged, labelled and open to examination at any time. When the question of removing the natural history and geological collections from the University grounds came up for consideration, the Trustees decided that, from the point of view of utility to the general public, it was advisable to combine all the geological, mineralogical and natural history collection, and to accomplish this it has been necessary to remove from the large hall what Mr Murray rightly calls "a heterogeneous collection of more or less obsolete machinery models".

But public interest in the fate of the Industrial and Technological Museum seems to have been suddenly replaced by the excitement of raising contingents in Victoria for active service in the South Africa War which began officially on the day that Professor Baldwin Spencer's letter appeared.

The Director of the Museum, Mr Walcott, wrote with some despair and asperity in his Annual Report for 1900 that: "The models and botanical specimens, which had been stored in the old Museum building were arranged as well as circumstances would permit"; and that the building had been "thrown open to the public". He pointed out, however, that this was a most unsatisfactory arrangement and he urged that proper provision be made for the exhibition of the Museum's collections.

Many of the Museum's exhibits at this time, a few critics had pointed out, as had the Director, were quite out of date. They needed to be replaced by improved ones of the latest kinds, Mr Walcott said, if the Museum was to maintain a position of usefulness in the community it served; and that the space occupied by the

[19] In a letter to *The Age* of 11 Oct. 1899, commenting favourably on R. A. F. Murray's letter, "Waratah" said: "I remember well the occasion of uncovering the bust in the Museum and the eloquent speeches made then by the Acting Governor (Sir John Madden), and the late Sir George Verdon, Baron von Mueller and Sir Frederick McCoy. It would have been a wild improbability for any person present that day to suppose the bust would, in a few years, be found where Mr Murray has discovered it".

Museum's collections in 1900 was only about one-fifth of that occupied thirty years earlier when it first opened. He therefore recommended that: "some action be immediately taken to provide suitable accommodation ... and place the Museum one more upon a useful basis".

But in the drive for economy and the fierce competition among the four branches of the Institution for a greater share of a limited available space the Industrial and Technological Museum fared badly. Writing in March 1901, Mr Walcott noted that "all mineral specimens are now being diverted to the National Museum", and that "the ethnographic collection[20] has been transferred to that Museum". Henceforth Mr Walcott himself, although he retained the position of Director of the Industrial and Technological Museum, was to spend the greater part of his time each day as Curator of the National Museum's geological and ethnographic collections.[21]

The year 1900 was not a happy one either administratively or financially for the Industrial and Technological Museum. The preceding three decades have been described as its "golden age". They covered a period of intense activity in the Museum which was in keeping with the times of rapid technical and industrial development in the community. Under the energetic and purposeful direction of James Cosmo Newbery, a professional staff of five with the assistance of an outside group of experts—including Baron von Mueller and Messrs Ellery and Foord—had amassed a large collection of industrial exhibits, including minerals, plant materials and animal products. Classes were conducted in metallurgy, mineralogy, assaying, mathematics, astronomy, engineering and mechanical drawing, modelling and telegraphy. Numerous chemical analyses were made, directed largely against the widespread adulteration of food which was rampant in the colony of Victoria because of the absence of health legislation to prevent it.[22] But the future did not inspire confidence. The Museum faced the new era with considerable uncertainty and pessimism. The Museum was never closed to the public officially; it was never closed in any formal way as far as available documentary records show. It can be presumed, however, that by the time of the inauguration of the Commonwealth of Australia it had been put into "mothballs", and in so far as the public was concerned, it had ceased to be a going concern. It was to remain in a dormant state for more than a decade after Federation.

[20] At its meeting on 29 Nov. 1900 the Committee of the Industrial and Technological Museum decided to "transfer the ethnological section of the Industrial and Technological Museum to the National Museum". See Minute Book, p. 175.

[21] In Walcott's annual report for 1901 to the Chairman of the Committee of the National Museum, he said: "During the year my time has been almost entirely devoted to the Ethnographic collection, and consequently the work of this (geological) section has been limited to the determination of specimens for the public." This report suggests that Walcott's duties, as Director of the Industrial and Technological Museum, demanded little, if any, of his time. See Annual Report of the Trustees, 1901, p. 26.

[22] *Year Book of the National Museums*, Melbourne, 1948, p. 22.

Chapter 5

Years of Stagnation and Discouragement (1901-15)

New Year's Day 1901 marked the inauguration of the Commonwealth of Australia, and on that day the Commonwealth's first Governor-General, Lord Hopetoun, and the first Federal Ministry led by Edmund Barton were sworn in. But Australia was still without a Federal Parliament. This was added to the new Commonwealth's machinery of government four months later when, on 9 May 1901, the Duke of Cornwall and York opened the first session of the first Federal Parliament in Melbourne. As a mark of respect to Victoria's royal visitors, and in honour of the occasion, the Trustees had the Institution specially illuminated from 6 to 11 May 1901.

The Museum retains an interesting exhibit item associated with this royal visit. When the ships of the royal party were approaching the Heads in Bass Strait, H. W. Jenvey of the Victorian Post Office, using equipment he had made, established wireless communication between Queenscliff and H.M.S. *St George* with a message of welcome. This was the first shore-to-ship wireless contact ever made in Australia. The Museum has the coherer—heart of receivers of the period—in its collection of historical material.

Exciting though this change in Australia's system of government might have seemed, it did not improve in any way the dire straits into which the Industrial and and Technological Museum had been plunged by the taking over of its accommodation by the National Museum. The Museum continued to exist officially, and its Committee continued to meet regularly, although the minutes of meetings record little, if anything, of importance. The Director retained his position and title but his time was spent mainly in another position in the National Museum. Although no formal administrative instruction seems to have been issued closing the Industrial and Technological Museum it had, nevertheless, already ceased to open to the public and no longer provided the public with an information service. Indeed no formal instruction was necessary to bring about these conditions. They were effected by the simple expedient of depriving the Museum of the numbers and kinds of officers required to staff it satisfactorily and by handing over the accommodation it occupied for staff and display to the National Museum.

In July 1901 a sub-committee of the Committee of the Industrial and Technological

Museum recommended two courses of action. First, that the Chamber of Commerce and the Chamber of Manufactures be asked if they would co-operate in the attempt to raise £5,000 towards the cost of erecting a new building for the Museum. Second, that the Government of Victoria be asked to provide a similar sum and to grant a site for a new building for the Museum at the corner of Russell and La Trobe Streets then occupied by a court of law. But at a meeting of the Committee of the Industrial and Technological Museum, on 25 July 1901, further action on the recommendation was postponed "till the question of the completion of the central portion of the Natural History Museum building has been dealt with by the Government."[1] Like most postponements this one produced no results and in their Annual Report for 1901 the Trustees were obliged to report that they had not been able to provide proper space for the exhibits of the Museum and that "until this can be done, this branch of the Institution can make no satisfactory progress". For that year the Director of the Museum did not submit an annual report to the Board of Trustees. It can only be inferred that the Director had no progress to report!

The Museum's position did not improve in the following year. In his annual report for 1902 the Director said that he had "no progress to report". He stressed, too, that a settled policy on the Museum's future was necessary so that "the present unsatisfactory position may be ended". Demands were increasing for technical instruction and for the development of Victoria's natural resources. It was to be regretted, therefore, the Director said, that "an institution which is supposed to render valuable aid in both these directions should be allowed to drift into a state of uselessness". As the building then occupied by the Museum could not provide the required space, the only remedy was, in his opinion, to obtain temporary premises and occupy them until a permanent building was provided. Then, in the new permanent building, the Museum could be re-organised without further undue delay. The Director ended his report for the year by saying: "It is impossible, under existing conditions, to make the Museum fulfil its proper function".[2]

In past years the Trustees had made some strenuous efforts to have the Industrial and Technological Museum, and other branches of the Institution, opened on Sundays. At last, in 1904, they achieved success. On 22 September in that year[3] the Legislative Assembly approved of a motion, moved on 6 July 1904[4] by the member for Carlton, F. H. Bromley, that the Institution be opened on Sundays. The National Museum and the National Gallery were accordingly opened on Sunday from 13 November 1904, between the hours of 2 p.m. and 5 p.m. From 27 November 1904 the Reference Library branch of the Public Library was also opened on Sundays, during the same hours. But this Sunday-opening had ceased to be of interest to the Committee and staff of the Industrial and Technological Museum because that museum had already ceased to open to the public at any time.

[1] Committee's Minute Book, 25 July 1901, p. 185.
[2] Annual Report of the Trustees, 1902, p. 15.
[3] *V.P.D.*, Vol. 108, 22 Sept. 1904, p. 1760.
[4] *V.P.D.*, Vol. 107, 6 July 1904, p. 148.

The Hon. Edward Langton, who had been a Trustee of the Institution for more than thirty years and who had been President of the Board of Trustees since Sir George Verdon's death in 1896, died on 5 October 1905[5]. But he had lived to see, in November 1904, what he had struggled for so long to bring about, namely, the opening of the Institution on Sundays to the public.

Three weeks later the Board of Trustees elected its Vice-President, Henry Gyles Turner,[6] to be the new President; and it also elected Sir Henry Wrixon to be the new Vice-President. Turner was a tall, lean man with a calm temperament and a genial disposition who had been a Trustee since 23 April 1884. He was a retired banker and he had combined an interest in literature with historical research and writing. He was instrumental in founding *The Melbourne Review*, which had been published for some ten years from 1875. He and Alexander Sutherland were for a time joint editors of the periodical. Turner's two volume work, *A History of the Colony of Victoria from its Discovery to its Absorption into the Commonwealth of Australia*, was published in 1904. But apart from his interests in history and in writing, he had many business interests.

With the year 1906 came the jubilee of the Institution. In the course of the fifty years which had passed since 1856 it had grown from a small Public Library on a block about fifty feet square until, in 1906, its buildings occupied more than two acres of land and it was organised into four branches—the Public Library,[7] the National Museum,[8] the National Gallery[9] and the inoperative Industrial and Technological Museum.[10] The Institution's celebrations were held from 21 to 28 April 1906. They culminated and concluded with a conversazione in the Institution's building which was conducted jointly on Saturday evening, 28 April 1906, by the Board of Trustees and the Council of the University of Melbourne.

In the following year the Museum lost its botanist, Charles Walter,[11] whose employment had begun in the Newbery era. He died in Melbourne in October 1907, aged

[5] R. Murray Smith "Edward Langton: A Reminiscence", *The Argus*, 14 Oct. 1905, p. 5.

[6] Henry Gyles Turner, F.R.G.S., banker, writer and historian. Born in London, 12 Dec. 1831. Arrived in Melbourne from England on 4 Dec. 1854. General Manager of the Commercial Bank of Australia from 1870 to 1901. President of the Board of Trustees of the Public Library, Museums, and National Gallery of Victoria from 26 Oct. 1905 to 30 Nov. 1920. Died 30 Nov. 1920.

[7] The Public Library of Victoria was formally opened to the public on Monday, 11 February 1856 by the Acting Governor, Major-General McArthur.

[8] The National Museum's origin can be traced back to 1854. But it only came under the control of the Institution's Board of Trustees in accordance with the provisions of the Library, Museums and National Gallery Act, 1869, which was assented to on 29 December 1869. The Board of Trustees set up in accordance with this Act held its first meeting on 7 Feb., 1870, to draw up rules and regulations under this Act.

[9] The National Gallery of Victoria was formally opened by Sir Redmond Barry on 24 December 1864 at 1 p.m. and according to him "nearly 500 visitors inspected the paintings, a goodly number, considering that it was a mail day and wet".

[10] The Industrial and Technological Museum was the only one of the four branches of the Institution to come into existence after the coming into force of the Library, Museums and National Gallery Act, 1869. The Museum was formally opened on 8 Sept., 1870.

[11] Charles Walter, botanist. Born 25 July 1831 in Germany. Died 11 Oct. 1907 at 164 Queen Street, Melbourne, Victoria.

76 years. It is believed that he was born in either Mecklenburg-Schwerin or Mecklenburg-Strelitz in northern Germany and that he migrated to Victoria as a young man in his middle twenties. Soon after his arrival, possibly in 1856, he began to collect seeds of native plants which he sent to his sister in Germany. This work brought him into contact with Victoria's Government Botanist, Baron von Mueller, who noted Walter's suitability for botanical work and sent him into various parts of Victoria to collect botanical specimens. In carrying out this work Walter added to the Victorian list a large number of species,[12] especially from eastern Gippsland. During the period 1869-71, Walter accompanied R. L. J. Ellery's geodetic survey party into far eastern Gippsland as botanical collector and official photographer. Among Walter's many botanical discoveries during this expedition was a magnificent mint bush, found at Croajingalong on Mount Ellery; it was named in his honour *Prostanthera Walteri* F. v M. and by this, it was said at the time of his death, his own name will be remembered "for all time". Another important discovery by Walter was at Howe Hill, where he was the first to find on Victorian soil the orchid *Dendrobium speciosum* Sm.

It can only be presumed that Charles Walter's employment by the Industrial and Technological Museum was continuous, but the date when this employment began and in what circumstances his appointment to the staff was made are not explained by available records. The Trustees' annual reports for 1887 and 1890 contain references to his work at the museum in collecting and exhibiting botanical specimens. Apparently the last official mention was made by the Director in February 1907—eight months before Walter's death. It merely said that: "A collection of native and introduced grasses was prepared by Mr C. Walter and labelled with their habitat and purposes for which they are adapted".[13] This reference suggests that when Walter died, later in that year, at the age of 76 years, he was still employed on the staff of the Museum.[14]

J. H. Maiden said in 1908 that Walter "published but little" but that "he well deserves a place in a list of Victorian botanists", although "some of his records in later years are faulty, which I attribute largely to his defective eyesight".[15] Walter was one of the early members of the Field Naturalists' Club[16] (although he was not a member of it at the time of his death) and had contributed articles to *The Victorian Naturalist* on various occasions.[17] It was said at the time of his death that:

[12] See Berthold Seeman (ed), *The Journal of Botany, British and Foreign* (London), vol. 5, 1867, pp. 139-140, for names of woods and other articles, used by the Yarra natives for weapons, etc., ascertained by Charles Walter. The material was identified by Baron von Mueller.

[13] Annual Report of the Trustees, 1906, p. 26.

[14] No official reference was made to Walter's death either in the Trustees Annual Reports or in the official minutes of either the Board of Trustees or the Committee of the Museum.

[15] J. H. Maiden, "Records of Victorian Botanists", *The Victorian Naturalist*. Vol. 25, No. 7, Nov., 1908, p. 114.

[16] Founded at a meeting at the Athenaeum in Melbourne on Monday evening 17 May 1880. That evening Professor McCoy, a Trustee of the Institution, was elected the Club's foundation president. See *The Cyclopedia of Victoria*, Vol. 2 1904, 78-9; see also *The Argus*, 18 May 1880, p. 5.

[17] His article, "A Trip to the Victorian Alps", was published in September 1899, his "Records of Plants new to Victoria and New Districts for Victorian Plants" in October 1899, and "A New Variety of an Orchid" in March 1907.

> For some years Mr Walter was employed at the Industrial and Technological Museum, arranging, labelling, etc., various economic products, grasses, seeds, timbers, etc., and did considerable work of a similar character for Baron von Mueller and the Agricultural Department, so that he came to be looked upon as an authority on Australian botany, and many correspondents in various parts of the world will miss the kindly way in which he was accustomed to supply information on botanical matters when an appeal was made to him.[18]

On 14 January 1908, R. L. J. Ellery, who had been the Chairman of the Committee of the Industrial and Technological Museum since 19 April 1882, died in Melbourne at the age of eighty years. He was succeeded in the chairmanship by the President of the Board of Trustees, Henry Gyles Turner.[19] This position would have been filled to greater advantage, normally, by an ordinary trustee rather than by the President of the Trustees who in these circumstances would sometimes find himself in the position of having to adjudicate on recommendations he had himself submitted in another capacity in another place. Moreover, in this particular instance, Henry Gyles Turner's previous way of life and his educational and cultural interests did not suggest that he had any special interests in the fields of applied science.

When the Hon. George Swinburne was appointed to the Board of Trustees on 6 July 1910, in place of James Smith,[21] neither he nor anybody else could then foresee the part he was soon afterwards destined to play with Colonel John Monash in having the Industrial and Technological Museum re-opened to the public. Swinburne was a prominent figure at this time; he was a self-made man who had inherited nothing in the way of position or material wealth. But he brought to his work in public life the assets of integrity, strength of character and managerial skill. He had migrated from England to Australia when he was about 25 years of age, arriving in Melbourne in November 1886; there, he joined the Melbourne branch of the London engineering firm, John Coates & Co., of which he was a partner. He first entered the Parliament of Victoria in October 1902 as the member for Hawthorn in the Legislative Assembly. Sixteen months later, in October 1904, he joined the Bent Ministry as Minister for Water Supply and Agriculture. His irrigation policy was a wise one and it benefited the State. He was instrumental in having established at Hawthorn the Eastern Suburbs Technical College which came into legal existence on 8 July 1908. He contributed large sums of money from his own purse towards the development of this college, which is known today as Swinburne College of Technology.

[18] *The Victorian Naturalist*, vol. 24, May 1907 to April 1908, p. 110.

[19] He was elected to the chairmanship by the Board of Trustees at its meeting on 19 Feb. 1908.

[20] The Hon. George Swinburne, engineer and politician. Born 3 Feb. 1861, at Paradise, near Newcastle-on-Tyne. Trustee of the Public Library, Museums and National Gallery of Victoria from 6 July 1910 to 4 Sept. 1928 and President of this Institution from 26 April 1928 to 4 Sept. 1928. Died 4 Sept. 1928.

[21] James Smith, journalist, critic and author. Born near Maidstone, Kent, England in 1820. Trustee of Public Library, Museums, and National Gallery of Victoria from (probably) July 1880 to 19 March 1910; and Treasurer to the Board of Trustees from 21 Dec. 1887 to 19 March 1910. He was a very versatile man, and from 1863 to 1868 he had been the Librarian of the Parliament of Victoria. Died 19 March 1910, at Hawthorn, Victoria.

The year in which Swinburne joined the Board of Trustees, the Director of the Museum pointed out that frequent inquiries were made during the year to inspect certain exhibits. Although he had provided the best means available for these inspections to be made, many regrets were expressed that the collections should continue to be stored in the basements of the Institute's buildings and to be, in consequence, wholly inaccessible to the public, except by special arrangement. The Director concluded this report on the following despairing note:

> To one having the interests of the Institution at heart, the unsatisfactory position of our museum is very discouraging. In notable contrast is the Sydney Museum, which is highly spoken of as a live and active concern, undoubtedly serving as a valuable agent in aiding the development of the natural resources of the country and in the general scheme of technical education adopted in New South Wales.[22]

A movement to have the Industrial and Technological Museum re-opened and restored to the public as an active and developing concern was started soon after Swinburne's appointment. At the Victorian Institute of Engineers' monthly meeting, on Wednesday evening 15 August 1912, the President, Colonel Monash,[23] informed the meeting that:

> One of the matters which the Council had in hand was the calling together of a general meeting of the scientific societies of Melbourne and certain public bodies for the purpose of bringing pressure to bear upon the proper authorities for the constitution of a well equipped Museum of Technology. Very many of the kindred societies had been approached in the matter, and the responses had been very satisfactory so far. They had received up-to-date satisfactory replies from the Mining Engineers, Chamber of Mines, Royal Society, the Royal Institute of British Architects, A.N.A., the Royal Victorian Institute of Architects, the Society of Chemical Industry of Victoria, and the Microscopical Society. There were still a number of replies to come in, and when the majority of societies had expressed their concurrence, steps would be taken to call a general meeting to discuss the question, frame a policy, and appoint an executive to put the project into force.[24]

One of the consequences of this meeting occurred two months later. Then, at a meeting of the Trustees, on Thursday 31 October 1912, a letter was received from the Victorian Institute of Engineers asking that "the Trustees appoint delegates to attend a meeting for the purpose of establishing a museum of technology in Melbourne and that the present Library building be not set apart for any purpose until such meeting shall have been held". At this meeting the Trustees decided to appoint the Building Committee and the Secretary to the Board of Trustees to represent them at the meeting with the Victorian Institute of Engineers.

[22] The Annual Report of the Trustees, 1910, p. 25.

[23] Later General Sir John Monash, G.C.M.G., K.C.B., V.D., B.A.(Melb.), LL.B.(Melb.), D.Eng.(Melb.), Hon. D.C.L.(Oxon.), Hon. LL.D. (Cantab. et Melb.), M.Inst.C.E., engineer, soldier and administrator. Born in Melbourne, 27 June 1865. President of the Victorian Institute of Engineers, 1912-5. Died in Melbourne, 8 Oct. 1931.

[24] *Proceedings of the Victorian Institute of Engineers*, vol. 13, 1912, p. 45.

Colonel Monash reported at the Institute's monthly meeting, on Wednesday evening, 13 November 1912, that "as a satisfactory response had been received from the scientific bodies and institutions entrusted in the matter of the proposed establishment of a museum of technology in Melbourne, he had called a meeting of delegates for Friday 22 November to discuss the proposal, formulate a policy, and appoint an executive committee to give effect thereto".[25] At this meeting the desirability of re-establishing the Industrial and Technological Museum was agreed upon by the delegates, and an executive committee was appointed[26] to take what steps were necessary to attain this object. This committee later called on the Trustees[27] and urged them to set apart, for the Industrial and Technological Museum's use, the Queen's Hall after the Public Library had moved its books from there into its new reading room.[28]

At its meeting on Thursday, 19 December 1912, the Trustees adopted a resolution, which had been moved by Dr Leeper and seconded by their Treasurer, Sir Edward Carlile,[29] to the following effect:

> That the Trustees recognise the importance of an efficient and well equipped technological museum, and acknowledge their obligations under the Trust; but they desire more information on the scheme's probable requirements in space etc., before they decide what they can do; and that a committee be appointed to collect information and to report to the Trustees as soon as possible.

At this same meeting the Board of Trustees appointed, in accordance with this resolution, the special committee. It consisted of the Trustees' Building Committee and Messrs Swinburne and Mackey. At a subsequent meeting of the Board, on Thursday, 27 February 1913, its secretary reported that this special committee had recommended that the Queen's Hall be reserved for the use of the Industrial and Technological Museum. The Trustees adopted this recommendation and ordered that Colonel Monash's movement for the re-opening of the Industrial and Technological Museum be informed accordingly.

Colonel Monash was reported to have announced this progress, at the annual general meeting of the Victorian Institute of Engineers on Wednesday evening 5 March 1913 in the following terms:

> The President announced that the movement which the Institute had initiated for the rehabilitation of the Technological Museum had that day achieved complete success. The body of delegates from the various societies elected a sub-

[25] Ibid, pp. 110-1.

[26] No records could be found to give the names of the members of this executive committee. The Secretary was Francis C. A. Stone, a delegate of the Society of Chemical Industry of Victoria.

[27] The Trustees did not record the date of this meeting or its results in its minute book. Nor could the date be discovered from other sources examined.

[28] Annual Report of the Trustees, 1912, p. 24.

[29] Sir Edward Carlile, Kt, K.C., Victorian public servant. Born 26 April 1845 in London. Sometime Parliamentary Draughtsman of the Parliament of Victoria. Treasurer of the Board of Trustees of the Public Library, Museums and National Gallery of Victoria from 30 Nov. 1911 to 15 Nov. 1917. Died 15 Nov. 1917 in Melbourne.

> committee which went into the middle of things, and interviewed the Public Library Trustees, and the public announcement had now been made that the Trustees had determined that the present Queen's Hall, upon being vacated by the library on the completion of their new building,[30] would be ear-marked for the Technological and Industrial Museum.
>
> Nothing remained to be done except to keep the Trustees up to the mark, and to suggest that the committee appointed by the Scientific societies be made a permanent committee to act in conjunction with the curator for all time, in seeing that the development of the museum was on lines of which they could all feel proud. He hoped within twelve months to see the Technological Museum in Melbourne.[31]

A past president of the Institute, James Alexander Smith, asked Colonel Monash if there would be sufficient funds available to the Museum or would it require further financial aid from the government. Colonel Monash replied that he believed that further assistance would be required; but that the case was so strong and the Museum such a popular democratic institution that there should be no difficulty in getting what was a comparatively small sum of money.[32]

By this time the Hon. George Swinburne had become Chairman of the Committee of the Industrial and Technological Museum.[33] On 31 July 1913 this Committee received and considered a letter from him urging two courses of action. One was that a deputation should call on the Premier, the Hon. W. A. Watt, to ask for the sum of £2,000 to re-establish the Museum; the other was that arrangements should be made for the Director of the Industrial and Technological Museum, Mr Walcott, to resume full-time duty in that Museum.

It is probable that the Trustees were too dilatory in making arrangements for this deputation to be formed and to call on the Premier and that Mr Swinburne adopted his own quicker methods for getting the money. Under circumstances that are now unknown, Swinburne was able to inform the Trustees, at their meeting on Thursday, 25 September 1913, that the Premier had promised to place £2,000 on the Estimates for the re-establishing of the Industrial and Technological Museum. With regard to Swinburne's second proposal, the following record was made in the minutes of the meeting of the Committee of the Industrial and Technological Museum on 11 November 1913:

> The question of obtaining the Curator's services solely for the Museum was discussed. Professor Spencer informed the Committee that Mr Walcott would be free from his work for the National Museum within ten days and that he would then be able to devote all his time to Technological Museum work, taking only general charge of the National Museum in an informal way till Mr Kershaw's[34] return to duty. Resolved accordingly.

[30] The Public Library's new Reading Room was formally opened on Friday evening 14 November 1913 by the Governor-General, Lord Denman. The ceremony took place in the Newspaper Room.

[31] *Proceedings of the Victoria Institute of Engineers*, vol. 14 (1913), p. 10.

[32] *Ibid*, p. 10.

[33] It has not been possible to ascertain the exact period that Swinburne held the chairmanship.

[34] James Andrew Kershaw (1866-1946). He later became Director of the National Museum of Victoria.

At a general meeting of the Victorian Institute of Engineers, on Wednesday evening, 8 October 1913, Colonel Monash, was reported to have announced in effect that:

> Since the last meeting members would probably have observed that Mr Swinburne, who had acted in the dual capacity of representative of the Public Library etc. Trustees on the Industrial and Technological Museum's committee, and also as a member of the executive furthering the movement for the Museum's re-establishment had succeeded in obtaining from the Honourable the Treasurer a definite promise of a first instalment of £2,000 towards the preliminary equipment of the Museum. That had followed the determination of the Trustees to place at the disposal of the Museum the extensive space, now occupied by the Public Library, known as Queen's Hall. A very important step has therefore been taken towards realisation of their aim. The matter has gone so far that the Curator of the Museum has been charged by the Public Library etc. Trustees with the drawing up of a complete syllabus or scheme for the equipment, furnishing, and arrangement of the exhibits in the Museum, and he has taken the course of inviting the learned and scientific societies to co-operate with him in taking charge of the technicalities of the scheme.
>
> In pursuance of a communication from Mr Walcott who is the Curator, the Council of this Institute appointed a sub-committee to draw up, and submit to the Council, a scheme for the proposed exhibits in the Museum's Engineering branch.[35] That at any rate gives the assurance that a very large field of assistance could be availed of by the Museum, and I venture the suggestion that the sub-committee might appeal to individual members for help in drawing up as complete, logical and systematic a scheme as their combined abilities would make possible. It is not expected that the whole of their wishes will be realised at the outset, but in the course of years the Museum might grow to be a worthy sister of some of the great institutions of the kind which exist in other parts of the world.[36]

Mr J. A. Smith asked Colonel Monash if the government grant made through the agency of the Hon. George Swinburne was unconditional, or conditional upon subscriptions being received from the public. Colonel Monash replied that his information was only such as was available to all through the press, but his recollection was that it was unconditional. He thought that Mr Swinburne himself expected very substantial support in the way of donations of exhibits, models and so on, and had also already taken steps to use his personal influence in that direction.

At a special meeting of the Committee of the Industrial and Technological Museum,

[35] Colonel Monash, in a letter dated 14 May 1914 to the Curator of the Industrial and Technological Museum, said: "I am sending you herewith an advance copy of the scheme I have drawn up for the section Civil Engineering for the Museum. This has yet to go before the Committee of Delegates of the Societies interested, for the purpose of harmonising same with other similar schemes in other departments; but I thought it would be useful to you to have this advance copy for your guidance for the time being."

Then, in a letter from the Technological Museum Movement Committee dated 15 Aug. 1914, to the Secretary to the Trustees, it was said: "On behalf of the Executive Committee of the Scientific Societies which are co-operating in the movement for the re-establishment of the Museum of Industry and Technology, we have pleasure in forwarding you herewith a scheme for the organisation and arrangement of the contents of the Museum."

[36] *Proceedings of the Victorian Institute of Engineers*, vol. 14, (1913), pp. 127-8.

on 11 November 1913, it was decided to obtain an architect's report on the cost of preparing the Queen's Hall for occupation by the Museum. The execution of this decision was left to the Chairman, the Hon. George Swinburne, and the Director, R. H. Walcott. In due course a contract was let for the making of the necessary renovations and alterations. The work to be done included the construction of two flights of stairs, each five feet wide, leading from the main entrance on the main floor to the gallery. The installation of these stairs involved the removal of certain cross walls but the resultant improvement in the general appearance of Queen's Hall was said at the time to have been very marked. The general appearance was further improved by the removal of the heavy gasoliers and by the re-decorating of the interior of Queen's Hall. But this work exceeded the estimated time and consequently the task of transferring collections from the basement to Queen's Hall was seriously delayed. The transfer began in mid-April 1914 and took about six weeks to complete; and so it was not until the end of May 1914 that the work of arranging the exhibits for display began in Queen's Hall. By the end of that year, however, this operation was well advanced.

Schemes for the organisation of the different sections of the Museum, which committees of societies and other bodies interested in the Museum's re-establishment had agreed to draft, provided useful guidance to the staff in building up the collections on systematic bases. The Museum was indebted to many members of these committees and other bodies for the time and thought they gave to the task of re-creating it. The Museum was likewise indebted to the Secretary of the Technological Museum Movement Committee, Mr F. C. A. Stone for the interest he took and the help he gave in this undertaking. It was also under a special obligation to the Mining and Metallurgical Committee of that time for its advice and assistance and for its having interested the Broken Hill Mine Managers' Association in this movement to re-create the Museum. The collective result of the activities undertaken by Mr Stone's committee, was that the Museum obtained valuable donations of exhibits from a number of different organisations.

Two valuable accessions by way of gift in this period deserve special mention.[37] One was the first motor car to be imported into Australia, which was donated by John Pender[38] of Brunswick, Victoria. This two-seater car had been made for him in the U.S.A. by Max Hertel of Chicago, and it had been landed in Melbourne on 8 November 1897. Pender made his first run five days later, when his car travelled nine miles on one gallon of stove naptha. His destination was the Coburg tram terminus and the journey probably started at Pender's factory in Brunswick.[39] The car's mechanism was practically controlled by one lever. For starting, the lever was drawn back, thereby operating a pawl and ratchet and making the crankshaft

[37] Annual Report of the Trustees, 1914, p. 42.

[38] For a biographical sketch of John Pender, see James Smith (editor), *The Cyclopedia of Victoria.* ii (1904), pp. 184-5.

[39] John Pender Pty. Ltd., manufacturers of machine-forged horse shoes, 769-777 Sydney Road, Brunswick, Victoria.

revolve. This movement filled the cylinders with the fuel charge and compressed it for ignition. Immediately the engine started, the trip on the lever was released and, by a forward movement of the lever itself, a catch held the pawl out of action. To stop the car, the lever was pulled slightly back to release the driving gears; then, by pulling the lever hard back, the brake was applied to the wheels. On top of the lever, which was hollow, a small handle fitted with a coarse screw operated, by means of connecting rods, the air valve in the pipe between the oil tank and the cylinders, and admitted air to mix with the fuel charge. The water and oil tanks were located under the seat.

The second important accession was a steam turbine and dynamo donated by C. A. Parsons & Co. Ltd. of Newcastle-on-Tyne, England. It was the Hon. Sir Charles Algernon Parsons (1854-1931) of this company who developed the steam turbine. His small vessel, *Turbinia*, with a speed of about 32 knots, made her appearance in June 1897 when she gave an unofficial and spectacular display of her speed at the naval review held at Spithead in honour of Queen Victoria's diamond jubilee. The display there by the *Turbinia* was sensational, and directed the attention of the Admiralty to the possibilities of using the turbine for the propulsion of warships and especially for high-speed torpedo-boat destroyers.[40]

In deciding on a selection of models to be ordered from a model-maker in Manchester, the Museum had the benefit of the advice of James Little (architecture), Wilfred Kernot (engineering) and Colonel Monash (reinforced concrete engineering). Colonel Monash, the Director reported, evinced a keen and special interest in the re-creation of the Museum; but the Museum was deprived of his advice and assistance in the middle of this re-organisation by the outbreak of the war and his departure overseas on active service.

An advantageous arrangement was made with the Council of the Swinburne Technical College—probably through the influence of the Hon. George Swinburne—whereby the College's Instructor in Plumbing, C. H. Wright, was given permission to have prepared, at the college and under his supervision, a complete and systematic series of exhibits illustrating modern plumbing practices. Mr Wright displayed a keen interest in this task; his grasp of what was required to make the collection educationally useful was thoroughly practical, and his work produced the results required by the Museum. Frederick W. Green, Instructor in Engineering, consented to write descriptive labels for the engineering exhibits. The necessity of having the assistance of an engineer for this work was both real and apparent, if the labelling was to be efficiently and correctly done. Indeed, very little had been done in the way of labelling generally because of the entire lack of the necessary professional and clerical staff to do the work.[41]

Five days after Brigadier-General John Monash landed at Gallipoli in command of the 4th Australian Infantry Brigade, the Committee of the Industrial and Technological Museum considered the re-opening date of the Museum. The President of the Board of Trustees, Mr H. G. Turner, presided at this meeting which was held on

[40] G. L. Overton, *Marine Engines: History and Development*, (H.M.S.O., London, 1935), pp. 40-52.
[41] The Annual Report of the Trustees, 1914, pp. 40-44.

Thursday, 29 April 1915. The Trustees decided that "the date for the opening of the Museum be left to the Chairman of the Committee" and that "the question of opening the Museum on Sundays be postponed". The Museum was in fact re-opened, but without ceremony of any kind to mark the occasion, on Monday 17 May 1915.[42] The next meeting of the Committee of the Museum took place ten days later under the chairmanship of the Hon. George Swinburne. But the official minutes of that meeting make no reference whatsoever to this important event of re-opening the Museum regularly to the public for the first time since it lost its display space to the National Museum of Victoria in 1899!

In the following month, on Wednesday, 9 June 1915 representatives of institutions which had made up the membership of the Technological Museum Movement were received by the President of the Trustees, Mr H. G. Turner, and the Chairman of the Committee of the Museum, the Hon. George Swinburne, at the Museum. There they were shown over the Museum's newly acquired premises and inspected the exhibits which the Museum authorities had been able to assemble and put on display for the public.

The procurement of exhibits was demanding much of the time of the Museum authorities at this juncture. The most active was perhaps the Chairman himself, the Hon. George Swinburne. He tried to build up the collections with specimens, obtained by gift and by purchase in Australia and in the United Kingdom; and in London he had the able and enthusiastic assistance of the Agent General for Victoria, the Hon. Sir Peter McBride. In a letter to McBride, date 6 July 1915, Swinburne said:

> I am glad to inform you that the Museum has been open now for five or six weeks, and has aroused considerable interest. The models, which have already come to hand, help to make a good show, and in addition a number of firms out here, have expressed their interest by donating models to us. The various Societies and Institutions, i.e. Architectural, Engineering, & Chemical Societies respectively, and others, are all working to make their departments a success.
>
> The War has considerably kept such movements back, but I have no fear that we shall ultimately succeed in making the Museum a valuable adjunct to Technical Education.
>
> I have told the Premier and Education Department of the valuable help and advice you have afforded us, and have taken every opportunity to let people know of the great help and assistance you have been to the Museum. It has been quite a pleasure to me to feel that we have some one like yourself, at the other end, who is so keenly sympathetic and interested.

But Mr Swinburne's attempts to get what he wanted in England for the Museum were not always free from friction and frustration when he ran up against the circumlocution offices in the British government machinery. On one occasion he was moved to write to the Director of the Museum, Mr Walcott:

> Did you ever know such stilted people as these Milords of Englishmen are, really the way they sit upon their cushioned chairs, discoursing of pettifogging

[42] For a report of the opening see *The Age*, 18 May 1915, p. 7.

> things, would be amusing if it were not sad. To think how they could help forward an Institution like ours; and the rules and regulations that they rake up to prevent them doing so, is a fine example of their bureaucratic minds.[43]

No critics of the Museum have been known to charge its staff with having been bureaucratically-minded in the sense that Swinburne used the term. This staff has, on the contrary, been motivated by its Trustees to serve the interest of the public which has never had cause to doubt this motivation. But it is unfortunate that the Trustee's staff records for the first half-century are not more precise and informative than they are. Indeed it has been impossible to ascertain with completeness and certainty the numbers and names of all persons on the staff of the Museum at particular points of time and the designations and duties of their appointments.[44] In some instances it has not been possible to identify in a satisfactory way members of the staff of the Museum who were employed there for quite long terms. Occasionally short notes were published in annual reports about particular members of the staff; but these notifications were published haphazardly and not in any systematic way. For instance, in the Director's annual report for 1914, he said: "I should like to place on record the long and faithful services of Miss M. E. E. Cane who resigned her post, as Assistant, at the beginning of the year. She had been employed in the Museum since 1883 and has done a large amount of useful work". Little information has been discovered from other available records about her thirty years of service. The Director's vague statement that Miss Cane resigned "at the beginning of the year" can fortunately be supplemented by reference to minutes of the meeting of the Committee of the Museum on 26 March 1914. These show that her resignation was to become effective on 1 May 1914, which was almost half way through the year and not "at the beginning". This standard of accuracy and completeness is fairly representative of the staff records at this time and in earlier years.

[43] Letter from the Hon. George Swinburne to R. H. Walcott, 20 April 1915.

[44] "A Return of Persons permanently employed in the Industrial and Technological Museum, under the Public Service Acts on the 31 Dec., 1888." *V.G.G.* No. 9, 31 Jan. 1889, p. 320 showed the following staff:

F. W. Barnard	Model Maker and Skilled Workman.
T. C. McBirney	Attendant.
W. H. Bardwell	Attendant.
C. Page	Attendant.

Again a similar "Return of persons permanently employed, under the Public Service Acts on the 31 Dec., 1913, in the Industrial and Technological Museum" *V.G.G.*, No. 20, 30 Jan. 1914, p. 398 showed the following staff:

R. H. Walcott	Curator.
T. W. Weatherill	Carpenter and Model Maker.
H. Hopkins	Senior Attendant.
J. Bates	Attendant.

It is evident that the Trustees employed more staff in the Industrial and Technological Museum both in 1888 and in 1913. A likely reason for the paucity of staff records over very long periods was the widespread use of temporary employment by the government. Many such employees were temporary in name only, the major part of their working lives being devoted to a "temporary" job, but they were never accorded the honour of official listing on departmental establishments.

Another case for comment is that of Miss M. I. McMillan. She was a contemporary of Miss Cane in the Museum and also seems to have rendered long and faithful service. The name McMillan occurs widely in the register cards for the fruit models made for or in the Museum from 1873 onwards to at least 1916, but it seems that three people of this name were involved. Thomas McMillan made fruit models at least up to 1875, but there is no direct evidence that he made them in the Museum laboratory. He could well have been a free-lance worker at the art. Later cards state that models were made in the Museum laboratory, but it was not until 1904 that the cards carried the name of the modeller, in this case Miss M. I. McMillan. In 1916 the name Miss M. I. McMillan is replaced by Miss M. J. McMillan. It has not been possible to ascertain whether the special skills of fruit modelling for the Museum were perpetuated on some kind of family basis. What is clear, however, is that no records of methods or materials were left to guide any successors, and there was no biological modelling done in the twenty years prior to its recommencement by Mr R. H. Fowler late in 1936.

Chapter 6

The Museum's Second Spring (1916-25)

The Museum's re-opening may be likened to a second spring; but for the Museum it was not a sunny one. Times were abnormal and critical for the nation had been at war since August 1914; and all other public business had gradually to be subordinated to the major task of prosecuting the war. But notwithstanding these dark clouds of adversity the Museum found a silver lining in the chairman of its Committee, the Hon. George Swinburne. In the re-building of the Museum he proved to be a man of drive, efficiency and vision who provided impetus and direction to its re-development programme. To some extent he was able to overcome the Museum's difficulties in obtaining exhibits in Great Britain. At his request Frederick Coates of London undertook to try to obtain suitable donations for the Museum and to supervise any model making work that was being done in Great Britain for the Museum.[1] Frederick Coates was a member of the engineering company of John Coates & Co. Ltd. of London with which, in earlier years, as we have already seen, Swinburne himself was associated, at first in London and later in Melbourne.

In time of war public interest naturally increases in exhibitions of arms and so the Museum's collection of arms was a display of considerable interest. Through Swinburne's efforts the Museum was able to buy a small collection of weapons in London consisting of Belgian, Danish, French, German, Russian and Turkish rifles, some of which had bayonets. These were added to in 1917 by a further donation of three service rifles from the Department of Defence. Three years earlier this Department had donated nineteen items consisting of rifles, carbines and muskets, and also eight bayonets. The collection of military and non-military arms was re-arranged by the honorary arms curator, Mr H. W. Fry, and each weapon was identified with a label which gave all essential details about it. Fry devoted a great deal of time to the re-organising of this collection and he himself printed by hand all the labels used. In addition he donated an extensive collection of rifle, revolver and pistol cartridges[2] which remains of considerable interest to visitors to the Museum today. However, Fry's industry and enthusiasm soon created a space problem for the Director of the Museum who said, in his annual report for 1918, that:

[1] Annual Report of the Trustees, 1915, p. 21.
[2] Annual Report of the Trustees, 1917, p. 18.

> Unfortunately the space devoted to small arms and ammunition is already overcrowded, as far as the cases are concerned, and when the guns presented by the Fisheries and Game Department are placed on the wall finality will be reached.

The Museum's collections were also added to in 1916 by donations from companies, public authorities and private persons within Australia. These donations included telephone and telegraph equipment from the Postmaster-General's Department; a model of the worked portion of the Broken Hill Lode from the North Broken Hill Co., the Sulphide Corporation, and the Silverton Tramway Co.; samples of apples, pears, peaches and plums from the Burnley Horticultural School; a collection of X-ray tubes from Dr Leslie John Clendinnen[3] of Hawksburn; and a model of an irrigation area at Werribee from the State Rivers and Water Supply Commission. An unusual gift was obtained from the Royal Naval Division through the Agent General for Victoria in London. It was a marble cannon ball found at Cape Helles.[4]

Good progress had been made in the task of re-establishing the Museum by the last year of the war. Important additions had been made to the collections despite the fact that relatively few exhibits had been obtained from overseas countries. But Frederick Coates continued to serve the Museum well at the London end, and in 1917 he managed to obtain a model of part of a Kerr steam turbine and a sectioned "Thor" pneumatic drill. Mr E. D. Thomson presented a two-stroke engine and an early type of gas engine invented by Bischop. Mr Wilfred Kernot[5] undertook the work of sectioning the two-stroke engine.

To offset this shortage of material from overseas the Director was able to report in 1918 that: "A considerable amount of local material has been obtained, and the preparation of this for exhibition, as well as working up old material, has occupied most of the time of the staff". He was also pleased with the development of his timber collection which, he said, had been "Augmented by a comprehensive set of specimens fully described, illustrating timber testing, factors affecting the strength of timbers, and injuries to timber by boring molluscs, insects, fungi, etc. A selection of steam bent timbers from the stored exhibits was renovated and placed on view". One acquisition which pleased the Director was a gift from the Victorian government of "a very handsome sideboard" which was veneered with figured Victorian mountain ash.[6] It had been exhibited at the Panama Exhibition which was opened at San Francisco on 20 February 1915, to celebrate the opening of the Panama Canal to connect the Pacific and Atlantic Oceans.

Hand in hand with acquisitions had necessarily to go the difficult process of "weeding out" exhibits which no longer warranted display or storage space. The space given to mining and ore-dressing models, for instance, was reduced. Although still

[3] Dr Colin Macdonald, "Roentgen's Discovery of the X-Ray and the Pioneer Melbourne Radiologists" (*V.H.M.*, vol. 36, no. 4, Nov. 1965, pp. 142-3).

[4] Annual Report of the Trustees, 1916, pp. 17-22.

[5] Later Professor Wilfred Noyce Kernot, B.C.E., M.Mech.E., M.Inst.C.E. (London), M.I.E. (Aust.). Born 1868 at Geelong, Victoria. Professor of Engineering in the University of Melbourne, 1932-36. Died 17 May 1945.

[6] Annual Report of the Trustees, 1918, p. 17.

of interest at the time, some of these models were obsolete and so had to be disposed of to make room for more modern exhibits. Among these more modern exhibits was the model of the Broken Hill silver-lead lode which, when displayed, attracted considerable public interest.

With the end of the war in sight the Director was faced again with an old and familiar problem. Expressing concern about the Museum's need for more space, he pointed out that the re-arrangement of cases had to be made frequently to provide for new exhibits; that the time was fast approaching when the limit of the Museum's accommodation would be reached and that as soon as normal conditions returned and material became available "from outside sources" it would be a "problem to provide for them". In order to drive home the urgency and significance of this space problem he added that "lack of space has, I think, something to do with the difficulty met with at times in securing certain exhibits from local firms who desire a more liberal display than we can give them". But the Director ended his annual report for 1918 on a more optimistic and encouraging note by saying:

> It is a source of gratification that there is every appearance of the Museum being appreciated and made use of by technical students and others for purposes of instruction. Facilities are given to classes to have access to the working models when we are previously notified of their intention to attend.[7]

Hostilities ended at last for a war-weary world on 11 November 1918, and members of the Committee and the staff looked forward with confidence to a world which, it was widely believed, would know war no more. But no sooner had hostilities ceased than Australia was swept with an influenza epidemic which had spread to this country from overseas. The total casualties from this epidemic throughout the world were greater than those suffered in the late war, and as a precautionary measure the Museum, in common with other branches of the Institution, was closed from Wednesday, 29 January 1919, to Tuesday 4 March 1919. Three months later, on Saturday, 28 June 1919, the Peace Treaty was signed at Versailles. The event was celebrated in Australia in the following month, on Saturday, 19 July 1919, by Peace Day; and on that day the Museum and other branches of the Institution's were closed. The Trustees had intended to illuminate the Institution's building but, owing to a shipping strike which had begun on the 14 July and continued for about fourteen weeks, this became impracticable. Indeed it soon became obvious that the Museum had problems in peacetime as well as in wartime that were continually to test the ingenuity of its Committee and staff.

In November 1920 the President of the Board of Trustees for the past fifteen years, Henry Gyles Turner, died in his 89th year. He had been a Trustee since 23 April 1884. On 26 October 1905, he had been elected President of the Board of Trustees following the death of the Hon. Edward Langton and he held this office continuously till his death. The Board of Trustees passed a resolution, at its meeting on 16 December 1920, which said in part that:

[7] Annual Report of the Trustees, 1918, p. 18.

> Long after he had reached the age when most men shrink from the burden of public life, and seek comfort and ease in retirement, he continued to preside with zeal and vigor over the great Institution, whose administration he made the main interest of his later years. . . . His broad culture and refined taste in art and literature, combined with his sagacity in business affairs, had peculiarly fitted him for the office which he held. The charm of his personality endeared him to his colleagues, and won not only their respect but their affection. The Trustees feel that his death has deprived them of a valued friend and will treasure in their minds his inspiring example.

The Vice-President, Dr Alexander Leeper,[8] was elected by the Board of Trustees, on 16 December 1920, to succeed to the office of President; and Emeritus Professor Sir Baldwin Spencer, who was the Honorary Director of the National Museum of Victoria, succeeded Dr Leeper in the office of Vice-President.

An important donation to the Museum in April 1920 was the first Australian made aeroplane to fly.[9] It was presented by John Robertson Duigan[10] who had designed it, built it, and flown it.

J. R. Duigan was the son of J. C. Duigan; he was educated at Brighton Grammar School in Victoria and later, from 1902 to 1904, he studied electrical and motor engineering at Finsbury College in London. After his return to Australia it is probable that he was employed by his father who was the owner of the Spring Plains Estate at Mia Mia. There, on 16 July 1910 he tested his aeroplane, a biplane, fitted with a 25-horsepower engine which had been built in Melbourne by E. J. Tilly. On this occasion the aeroplane made a hop of twenty-four feet. After further tests, consisting of several more small hops, Duigan made a number of changes in the machine's design. Later he succeeded in flying sixty yards. After a minor crash in September 1910 he changed the machine's design again. Then, on 3 May 1911, at the racecourse at Bendigo, he flew almost three-quarters of a mile and he attained a height of sixty feet.[11] In the same month, on 30 May 1911, he made a flight at Mia Mia before Major Percy Thomas Hedges, an engineer officer who was said to have been representing the Department of Defence, and W. Forrest Marshal who was the Honorary Secretary of the Victorian Section of the Aerial League of Australia.[12]

Reference was made to the Duigan aeroplane at a lecture, entitled "The Advance in Flying", which was given at the Museum on Tuesday evening 25 August 1925 by Mr Walter Bassett who was then a Senior Lecturer in Mechanical Engineering and Aerodynamics in the University of Melbourne. In this lecture he spoke with the additional authority of a wartime pilot of the Australian Flying Corps when he said

[8] Alexander Leeper, M.A.(Dub.), LL.D.(Dub.). Born 3 June 1848 in Dublin. President of the Trustees of the Public Library, Museums and the National Gallery of Victoria from 16 Dec. 1920 to 26 April 1928. Died 6 Aug. 1934, in Melbourne.

[9] Old Boy, "Australian Aviator: Victorian designed Biplane" (*The Argus*, 28 Jan., 1911) p. 8.

[10] Later Captain John Robertson Duigan, M.C., R.L.(A.M.F.) Australian pioneer designer, maker and flyer of powered aircraft. Born 31 May 1882 at Terang, Victoria. Served in the War of 1914-18 with the Australian Flying Corps. Died 11 ~~Feb.~~ June 1951 at Ringwood, Victoria.

[11] Stanley Brogden, *The History of Australian Aviation* (The Hawthorn Press, Melbourne, 1960), pp. 20-2.

[12] *The Argus*, 1 June 1911, p. 7.

Erratum. p. 68 Note 10
For 11 Feb. 1951 read 11 June 1951

of the Duigan aeroplane that: "An examination of the machine, which hung in the Museum, revealed that the builder had used practically the same means of obtaining stability and control as were used now".[13]

The Duigan Flight Memorial, about four miles from Mia Mia on the Mia Mia-Lancefield road, was unveiled on Saturday, 28 May 1960, by Air Marshal Sir Richard Williams. Those present at the unveiling included Mr Fowler and Mr Kendall of the Museum. Later that same year the J. R. Duigan Exhibition, to commemorate the fiftieth anniversary of the first flight of an Australian-built aeroplane, was held, under the Museum's auspices, in the foyer of the building. The exhibition commenced on the 15 July 1960 and lasted for one month. A decade later the machine was restored to the condition in which it existed at the time of its last flight before the War of 1914-18. Today it is one of the main exhibits in the McArthur Hall.

Another donation to the Museum in 1920, which was of interest to ship-lovers, was a sectioned model of H.M.A.S. *Cerberus*. It was donated by the widow of the late Engineer-Commander Breaks of Williamstown in Victoria.[14] He had served on the ship and he had made the model of it.

The *Cerberus* was one of the first British naval ships to be built without sails and to have its entire armament located in turrets. It was built for the government of Victoria, in accordance with British Admiralty plans, by Palmer & Co. of Jarrow, Newcastle-on-Tyne. Its overall length was 235 feet, and it was officially described in 1886 as a double-screw, iron armour-plated turret ship of 3,480 tons and 1,600 horse-power. It carried four 10″ muzzle-loading guns and four Nordenfelt guns.[15] The keel had been laid in September 1867 and the ship completed about three years later. Under the command of Captain William Henry Panter of the Victorian Navy and formerly of the Royal Navy, the *Cerberus* sailed from Plymouth on 7 November 1870, arriving in Melbourne on 9 April 1871. This ship was the second one to join the Victorian Navy, and after Federation in 1901 it became part of the fleet of the Commonwealth naval forces. During all the years it was commissioned it was employed for most of the time at Williamstown as a depot ship. It was unsuitable for large-scale manoeuvres at sea.[16] The Commonwealth government sold the *Cerberus* in April 1924 for scrap. Two years later, in September 1926, the stripped vessel was sunk at Black Rock to function as a breakwater.

Before and during the first quarter of the twentieth century, since separated from us by another world war and great technological advances, Australia's wool industry shaped the nation's society in a large measure and contributed much to its progress economically, politically and socially. The development of the woollen industry was therefore one of the Museum's major interests.

In 1922 the Commonwealth's Central Wool Committee presented to the Museum

[13] *The Argus*, 26 Aug. 1925, p. 15.

[14] Engineer Commander James Lennox Breaks, R.A.N. Born 2 April 1849, at Southsea, England. Died 6 Feb. 1919 at Williamstown, Victoria.

[15] *Victorian Defence Forces List*, 1 Aug. 1886, p. 9.

[16] G. L. Macandie, *The Genesis of the Royal Australian Navy* (Department of the Navy, Melbourne, 1949), pp. 24-6.

a collection of 848 different types of Australian wool;[17] these samples represented the different classes of wool found by the Committee, during the course of its operations, in a complete average Australian wool clip. Only two of these collections were made by the Committee which presented the other one to the Technological Museum in Sydney.[18]

This Committee came into existence as a wartime measure; it was the outcome of private enterprise's inability to satisfy the enormous demands that the War of 1914-18 was making on Great Britain for wool. The Committee was appointed on 21 November 1916 at a conference of fifty representatives of Australia's wool industry and its powers resided in regulations made for its administration under the War Precautions Act.[19] The private sale of wool was prohibited and the whole business of selling was entrusted to "what was substantially a government department functioning under the direct supervision of the Prime Minister". The Committee's experience enabled it to classify Australia's wool clip into 848 types and on this basis it fixed a selling price for each type.

Some years later this collection was transferred "on extended loan" to the Gordon Institute of Technology in Geelong. The Principal of that Institute said, in a letter dated 14 March 1952 to the Museum, that: "I am most happy to accept this offer and will see that good use is made of the collection which will be housed in a prominent part of our Wool and Textile Exhibit Hall".[20]

The acquisitions in 1925 included a motor-cycle engine from Douglas Motors Ltd. in England and also a sectioned Indian motor cycle engine from Rhodes Motor Cycle Co. of Melbourne.

Today the motor cycle plays an important role in our highly mechanised society. But we rarely think of the history of its development and we rarely stop to imagine the world when it did not have motor cycles. They provide large numbers of people in all parts of the world nowadays with relatively cheap, convenient and rapid personal mechanical transport. Before 1900 France and Germany were pioneer nations in motor cycle development. But by 1914 British engineers, particularly in Birmingham, Coventry and Wolverhampton, had made the British motor cycle the best on the market. In face of growing foreign challenges this technical and commercial lead gained by Great Britain was maintained for the next thirty years.

The widespread use of the motor cycle was not due wholly to the facilities which its general usefulness made available. It served another pressing human need; it satisfied a need for adventure, risk, uncertainty and Bohemianism; and it provided a means for many to escape from those depressing pre-war English Sundays!

The first motor cycle, with an internal-combustion engine, to be manufactured and marketed commercially was probably that designed by two brothers in Munich,

[17] For a description of each type and its price see Sir John Higgins, *The Stabilisation or the Equalisation or the Insurance of Wool Values* (printed by Sands & McDougall Pty. Ltd., Melbourne, 1931), pp. 124-204.

[18] Now the Museum of Applied Arts and Sciences, Sydney, N.S.W.

[19] For the organisation and functions of this Committee see *The Official History of Australia in the War of 1914-1918*, vol. xi, p. 573 ff.

[20] See also Minutes of Trustees' meeting on 19 May 1952, item 326.

Friedrich and Wilhelm Hildebrandt. In 1892 they made a small two-stroke petrol engine with the assistance of Alois Wolfmüller and his mechanic, Hans Greisenhof. In the following year the Hildebrandts manufactured a twin-cylinder four-stroke horizontal petrol engine. They called their machine a "motorrad", i.e. a motor cycle and thus originated the name by which this class of vehicle is known today.[21]

The Douglas and the Indian motor cycles were of course only two of many classes of motor cycles in 1925. The first Douglas motor cycle was a $2\frac{3}{4}$ h.p. version with a direct belt-drive and a frame based on the pedal-bicycle type. It was placed on the market in 1907. In the following year the frame was re-designed with springforks and horizontal tubes. These tubes were incorporated in the lower part of the frame to accommodate the horizontally opposed engine. The first Indian motor cycle weighed only 98 pounds and was fitted with a $1\frac{3}{4}$ horse power single-cylinder air-cooled gasoline engine. It was designed in 1901 by the noted bicycle racer, Oscar Hedstrom, for the Hendee Manufacturing Co. of Springfield, Massachusetts. The Indian motor cycle's performance was so successful that it was put into production in 1902 when 143 were manufactured. It became popular from the outset.

In 1925 the Acting Chairman of the Committee of the Museum, Mr R. C. D. Elliott,[22] directed a campaign to make the Museum better known to the public. It began in January when *The Herald* advertised prizes for the best essays describing a visit to the Industrial and Technological Museum. The closing date for entries was the end of February 1925.[23] The competition created considerable public interest and the Chief Inspector of Secondary Schools, Mr M. P. Hansen, M.A., LL.B., agreed to make the final adjudication. He said: "There is no doubt that museums offer a rich store of knowledge to children, and though there are zealous teachers who conduct their classes round our museums, I think the educational possibilities of these visits could be more fully exploited than they are. The Technological Museum is a valuable adjunct to the education of school children".[24] On Thursday afternoon 5 February the Chairman and Members of the Tariff Board paid an official visit to the Museum where they were received by the President of the Board of Trustees, Dr Leeper, and the Acting Chairman of the Committee of the Museum, Mr Elliott. The Director, Mr Walcott, conducted the visitors through the Museum, explained its objects and functions and pointed our exhibits of special interest.

The first prize of £5.5. in the *Herald's* Museum Competition was won by Dr J. R. Pound of Ballarat. An extract of this essay was subsequently published in *The Herald*.[25] This extract began by saying:

[21] C. F. Caunter, *The History and Development of Motor cycles* (published for the Science Museum by Her Majesty's Stationery Office, London, 1955), part 1 p. v and p. 5.

[22] Robert Charles Dunlop Elliott, C.M.G. Newspaper proprietor. Born 28 Oct. 1886. Trustee of the Public Library, Museums and National Gallery from 25 March 1924 to 15 March 1945. Victorian Senator 1928-34. Died 6 March 1950.

[23] *The Herald*, 31 Jan. 1925, p. 6.

[24] *The Herald*, 3 Feb. 1925, p. 4.

[25] *The Herald*, 10 March 1925, p. 14.

> The Technological Museum deals with man's industries—their raw materials, methods and products. Manufactures are, indeed, the material mark of civilisation; from them alone the quality of a civilisation can be judged.

The author also pointed out that:

> The Museum makes us realise that few men are producers, that it is a man's job to produce a stable commodity, to invent or discover a new thing or a new process, and that to find a new principle of science or to found a new branch of technology, or to form a new field of art, is the work of a great man.

In addition the *Industrial Australian and Mining Standard* published a series of three illustrated articles in February-March 1925 which described the Museum and its collections. They took the reader, figuratively speaking, on a tour of inspection and stressed the need for a better appreciation of the Museum by the public.

The first article pointed out that the Museum was "a veritable storehouse of knowledge, a modern Aladdin's cave for those in search of information and education in an easily assimilated form"; that it contained "the finest combined collection of animal, vegetable, and mineral products and their manufactures in the Commonwealth"; that they "reflect the agricultural, mining and industrial activities and achievements of our country"; and that they "also bring the visitor into close contact with the products of other lands".

The second article described exhibits in the Timber, Agricultural and Mining and Metallurgy sections. In one part it said: "Several striking pieces of furniture are displayed here, the workmanship and beauty of the timber employed leaving nothing to be desired. Samples of bent woods, and their use in the building of vehicles, are displayed in profusion, while mention should be made of a magnificent slab of Australian red cedar 6 feet in diameter and 14 feet long, which has recently been presented to the Museum"; it was an excellent colour and well figured. The article pointed out that in the Agricultural section there were, amongst other exhibits, a model of a 70-ton silo which Victoria's Department of Agriculture had erected, and miniature stump-jump, disc and mouldboard ploughs, disc cultivators, harrows and scarifiers. A portion of the original model of a stump-jump plough invented in 1874 by R. Shapland of South Australia, was also on view. The article drew attention to other related models which included rakes, stripping machines, haymakers, threshing machines, grinding mills, sheep and cattle trucking yards, a wine press and other machinery for rapid and efficient agricultural production. A modern separator could also be seen; it had been sectioned to show the machine's action.

In the Mining and Metallurgy section, the article continued, there was a comprehensive collection of Australian and overseas ores, and not only were these ores shown but also, wherever possible, the related concentrates. In its Mining Operations section, this second article drew attention to the models which depicted various phases of mining and to a profusion of tools and appliances which were used in the industry. Another exhibit which attracted special mention was a model of the Clunes and Port Phillip Mining Co. mine and battery as they were in 1858. In addition to its historic

importance, the model was of interest because it showed what a quartz lode was and how it was mined. There were also models of water wheels, ventilating fans, blowers and other air-giving devices, a portable boring tower, tools used in boring, horse- and hand-whims, windlasses, a primitive wooden stamper battery, a modern five-stamp mill, a modern mine cage of the kind then used at Broken Hill and also ore-dressing machinery. Methods of timbering mine drives and shafts were depicted by the same means.

The third article concerned itself with the sections on Building Construction, Arms, Electrical and General Engineering and Transportation. It pointed out that the layman who was contemplating the erection of a house, be it ever so humble, would obviously benefit from an inspection of the Museum's Building Construction exhibits. The models illustrating methods of building construction included the formation and trussing of roofs and the layout of flooring and exhibits dealing with sanitation. In addition to individual exhibits, the sewering of houses, according to the regulations of the Melbourne and Metropolitan Board of Works was illustrated. Sections of a house showed how connections were made with underground pipes and illustrated the general layout of the system.

In the Arms section the article pointed out that the Museum had been primarily interested in military weapons rather than sporting weapons. The collection of British weapons was comprehensive, while weapons from foreign armed services were well represented and included selections of French and German machine guns. The evolution of the modern rifle could be traced from the cumbersome matchlock musket of earlier ages.

In its "Electrical and General Engineering" section, the article drew attention to various forms of early and modern telephonic apparatus. The exhibits included the first form of transmitter invented by Thomas Edison, parts used in a modern transmitter, and both magnetic and common battery switchboards. All these exhibits showed visually the gradual development of this branch of engineering which has greatly benefited both commercial and domestic life.

Attention was also invited to the exhibits illustrating developments in methods of transportation by land, sea and air. Models of various types of aircraft and of aeroplane engines were on display. Included were models of the Wright brothers biplane which was the first really successful heavier-than-air machine to fly, of the Farman biplane, the Avro triplane and of the monoplane in which, on 25 July 1909, Louis Blériot became the first person to fly across the English Channel. Sea transport was represented by a number of models which included one of the *Orient*, once a famous mail steamer on the England-Australia run and one of the *Ballarat*, once another well-known ship on the same run. Another model of special interest was that of the first steamboat, *Charlotte Dundas*, which had first sailed on Clyde Canal in Scotland, on 28 March 1802, to the wonderment of a large gathering of spectators. Attention was also directed to sections of steel rails of the kinds then used in Australian railways and tramways. The article also pointed out that blue prints hung on the walls of the gallery which gave details of the latest types of steam locomotives—including the C and K classes—then in use in the Victorian Railways.

This useful series of articles ended with the comment that an attempt had been made to describe, but in a necessarily superficial manner, some of the historic and educational exhibits with which the Museum abounded. It stressed, however, that no description, however detailed, could take the place of an actual inspection of the Museum.

In May 1925 the Museum had been re-opened for ten years. The Director, who had re-opened it in May 1915, was still struggling to develop it with wholly inadequate resources in staff, space and money. He rang out the old year in 1925, so to speak, on a note long familiar to all concerned with the Museum's administration and development. He pleaded for more space, a new site for a Museum and a better system for the classification of exhibits. He pointed out that during the past year it had again been necessary to re-arrange a number of exhibits in order to provide more space; that efforts had been made to "improve the classification which had been destroyed to a large extent in the engineering sections by the addition of new material wherever there was room for it". This "constant re-arranging of the exhibits", clearly indicated "the immediate need of securing a site for a new museum".[26] But these conditions were to continue for R. H. Walcott until the end of his professional career.

[26] Annual Report of the Trustees, 1925, p. 19.

Chapter 7

Insufficient Space Retards Museum's Development (1926-38)

By 1926 the crowded conditions of the Museum were causing considerable concern to the Director. Up to this time progress had been maintained in augmenting the Museum's various collections, but henceforth the lack of adequate space for display and storage purposes was to retard the Museum's systematic development. The Director pointed out that it was "impossible for more than a few people at any one time to see the various exhibits". In some instances, when lectures were being given, intervening display cases prevented the lecturer from being heard and seen by parts of his audience. It was in these conditions of crowding, with display cases intervening between the lecturer and the audience, that the Director himself, on Saturday afternoon, 13 March 1926, gave a public lecture entitled "Early Methods of Mining in Victoria". The Director was understandably pessimistic. "This trouble will increase with time, unless further accommodation is provided, owing to the constant need of encroaching upon passage ways for the display of new exhibits."[1]

One of the Museum's collections, the expansion of which at this period made special demands on the available space, was the important one of horology, illustrating the development of time-keeping devices from the earliest times to the present day.

The first spring clocks and the earliest watches were made about 1500 A.D., but up to about the year 1650, the regulating system of all clocks and watches was of such a crude type that the timepieces were unable to maintain any great accuracy. It was the use of the pendulum as a controller that led to the development of clocks capable of accurate timekeeping. The adoption of the pendulum was due to the work, between 1640 and 1658, of Christian Huygens (1629-95) in the Netherlands and of Galileo in Italy. After about 1660 all new clocks were usually fitted with either a pendulum or a balance-spring—this latter device making a similar improvement in timekeeping. Nevertheless, the development of timepieces up to the eighteenth century was not wholly satisfactory as they did not meet the demands for accuracy that are made on modern watches and clocks and failed entirely to provide reliable, portable timepieces. In the end it was developments in the science of navigation that demanded greater

[1] The Annual Report of the Trustees, 1926, p. 22.

accuracy in timepieces. In 1714 the British government offered rewards of £10,000, £15,000 and £20,000 for the best constructed chronometers that would allow a ship's longitude to be determined within sixty, forty and thirty nautical miles respectively after a voyage from England to the West Indies—involving a running period of at least six weeks.

John Harrison (1693-1776), a Yorkshire-born carpenter with a disposition towards improving the construction of clocks and watches in order to increase their accuracy in measuring time, decided to try for one of these government prizes. His efforts were spread over a number of years, and about 1762 one of his chronometers was tested on a voyage from England to Jamaica. When the testing ship returned to Portsmouth the chronometer was found to have lost only 1 minute 54½ seconds. This unusual accuracy had enabled the longitude to be determined within 18 nautical miles. Harrison then claimed the full reward of £20,000. But it was only after further trials that he was paid £10,000 in 1765; and what was said to have been the balance was paid to him two years later.[2] Harrison's invention enabled a ship's longitude at sea to be determined precisely; and this new accuracy in navigation helped to end the long and disastrous history of shipwrecks previously due to mariners having been unable, on long voyages, to find their positions at sea with sufficient accuracy. Harrison's chronometer, and that of Pierre Le Roy (1717-85) of Paris,[3] marked the beginning of the present-day watch.

The Museum of course exhibits timepieces primarily for their technical interest; and if they happen to be beautiful and pleasing to the eye as well then this aesthetic pleasure is an additional asset.

The generosity of one of Melbourne's clock and watch collectors, John Askew,[4] caused the Museum authorities, both satisfaction and anxiety in 1928. He deposited on loan with the Museum a collection of about a hundred clocks and watches of various types, and his intention was that this collection should become the property of the Trustees after his death.[5]

At a meeting of the Committee of the Museum on 24 April 1930, an offer by Askew was considered which was to the effect that he would present his complete collection of clocks and watches if they were placed on, presumably permanent, exhibition. The Director reported at the meeting that although the Museum wanted the collection he could not provide room for its accommodation and exhibition; and that the question of providing space elsewhere for the collection was a matter for decision by the Trustees. After some examination of the space problem the Committee was informed, at its next meeting, on 29 May 1930, that space had been found for the collection. It seems, however, that the Committee did not satisfy Askew's requirements

[2] Humphrey Quill, *John Harrison: The Man who found Longitude* (John Baker Publishers Ltd., London, 1966), p. 203.

[3] *Ibid*, p. 159.

[4] John Askew, partner of Twentyman and Askew, engineers and architects, Melbourne. Born 27 Aug. 1890 at Deepdene. Died 23 Dec. 1945 at South Yarra, Victoria.

[5] Annual Report of the Trustees, 1928, p. 4 and p. 29. See also Minutes of meeting of the Committee of the Industrial and Technological Museum, 25 Oct. 1928, p. 10.

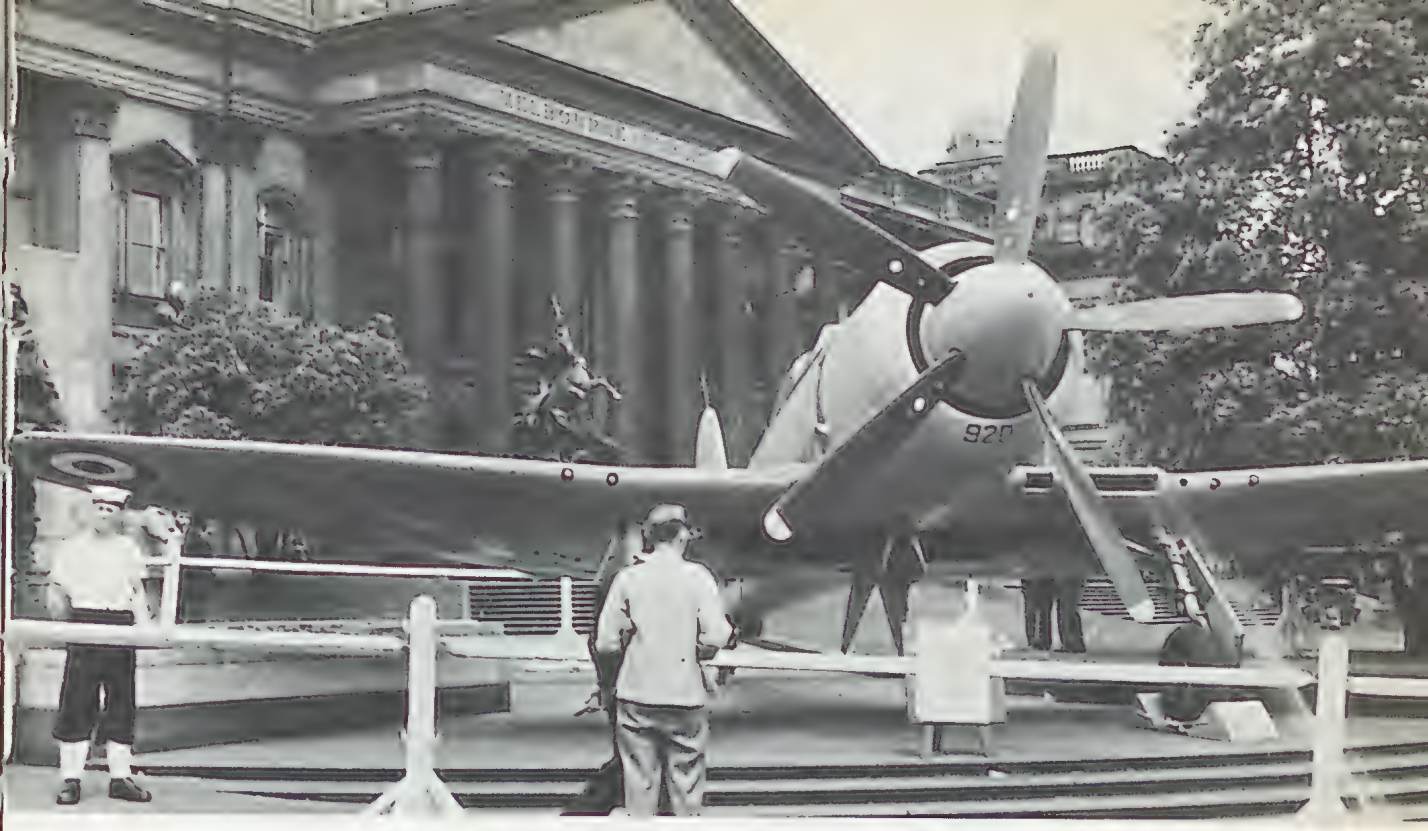


PLATE 36. A Sea Fury lent by the Royal Australian Navy.

The Jubilee of Flight Exhibition, 1953.

PLATE 37. The display in the Palmer Hall.

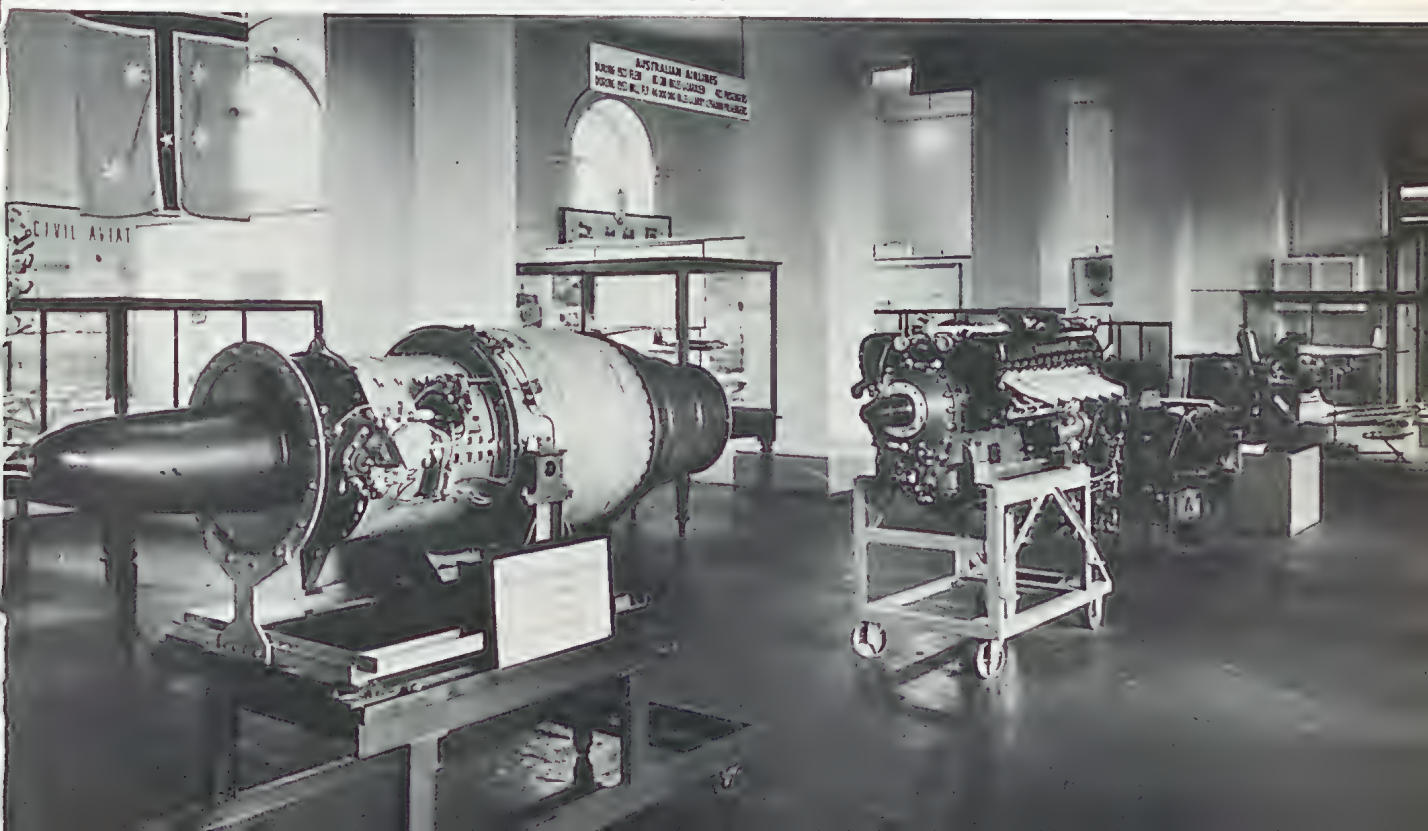


PLATE 38. Sir Laurence John Hartnett.
Trustee 1945-71. Chairman 1958-60.

PLATE 39. Frank Morres Read.
Trustee 1952- . Chairman 1960-62, 1967-68.

PLATE 40. Sir Leslie Harold Martin.
Trustee 1953-63. Chairman 1962-63.

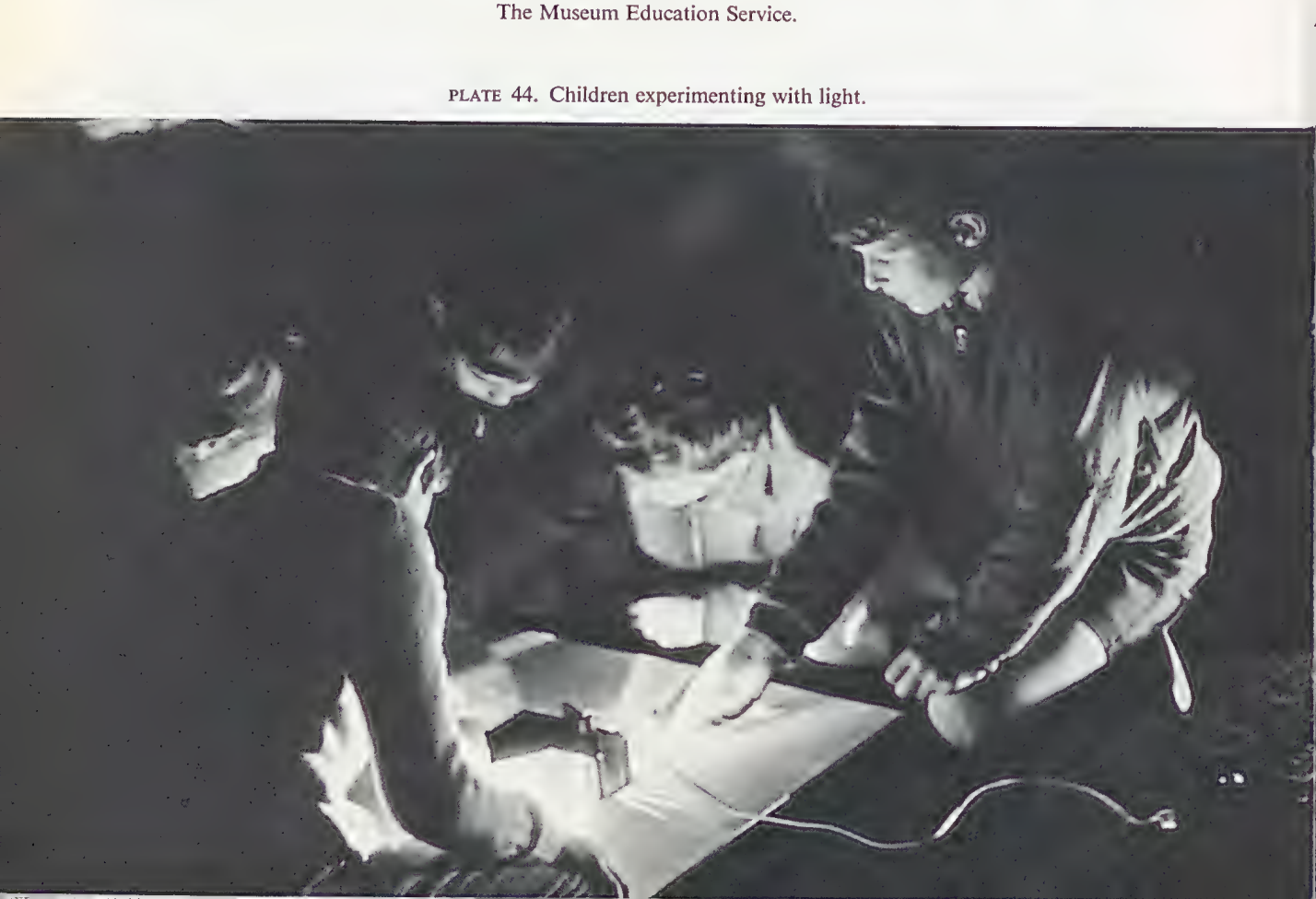
PLATE 41. His Honour Judge Albert Leonard Read.
Trustee 1962-68. Chairman 1965-67.

PLATE 42. Dr. James Adam Louis Matheson. The Centenary Chairman.

PLATE 43. A school group waiting to enter the education centre.

The Museum Education Service.

PLATE 44. Children experimenting with light.



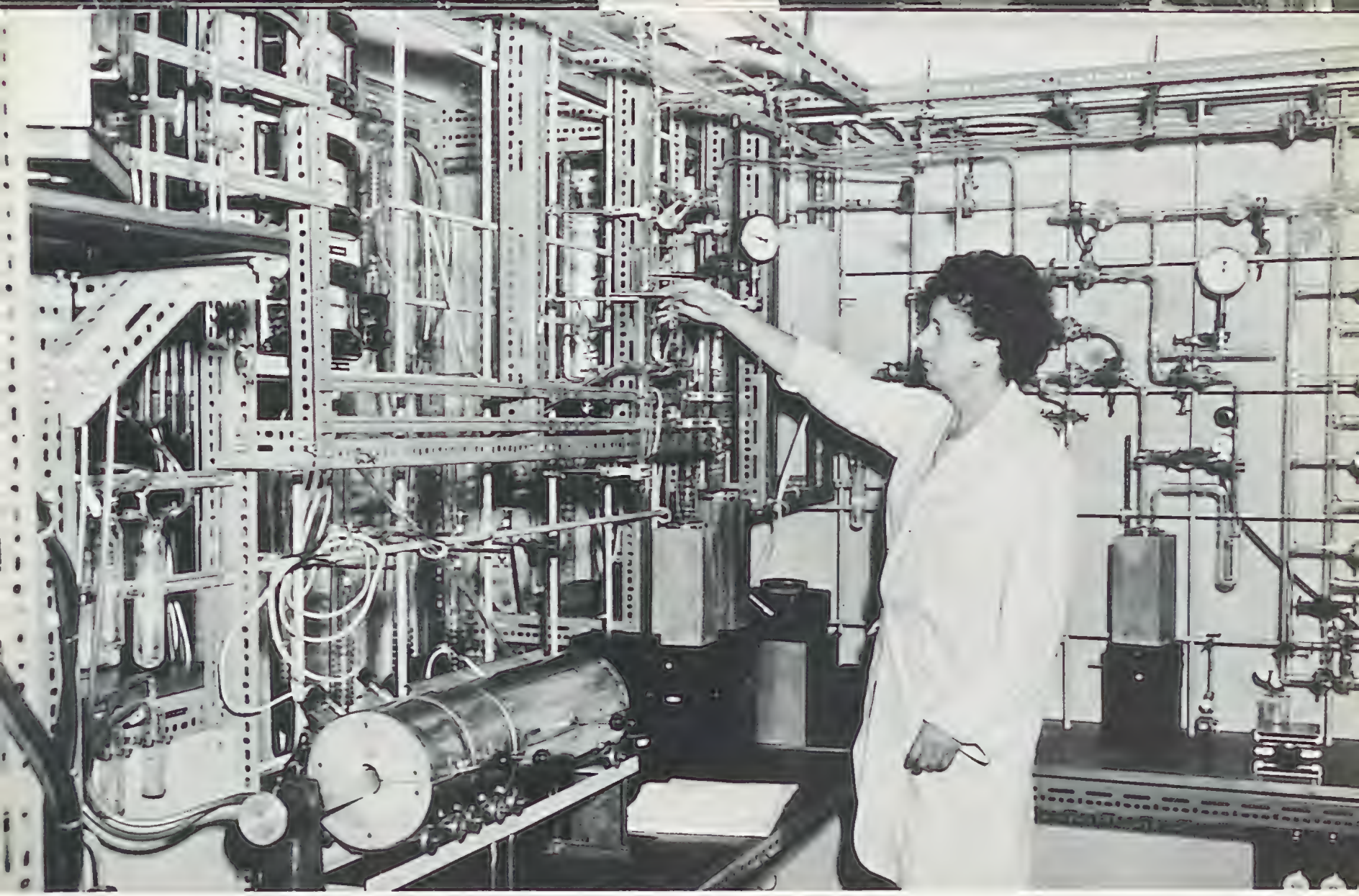


PLATE 45. Miss Anne Bermingham in the Radiocarbon Dating Laboratory.

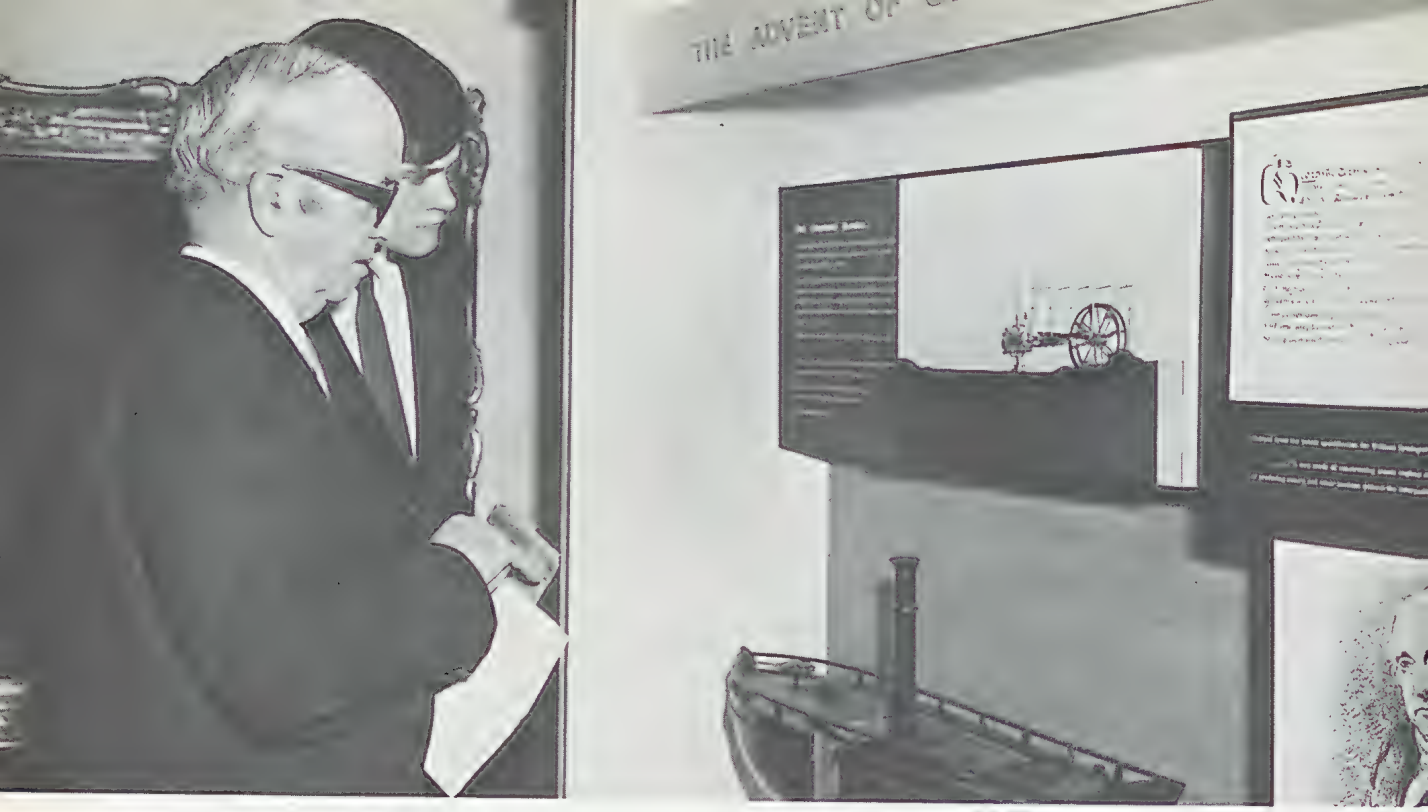


PLATE 46. The Director, Mr. R. H. Fowler, with Mr. Ian Symington, descendant of William Symington, designer of the *Charlotte Dundas*, the first successful steam driven vessel.

PLATE 47. Industrial Safety. A display combining scientific interest and a significant social message.

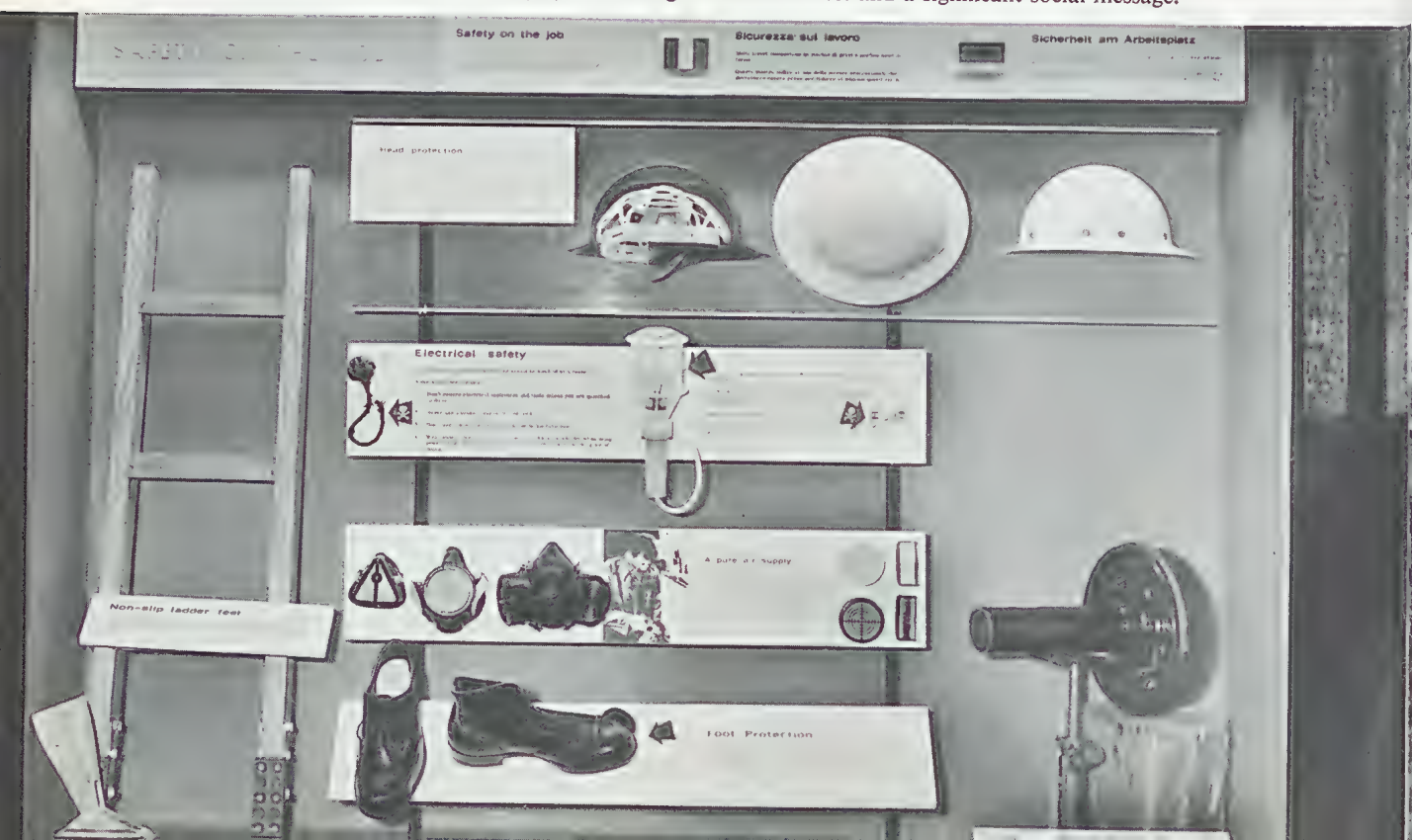


PLATE 48. Before.

Restoration of a 1910 tractor.

PLATE 49. After.

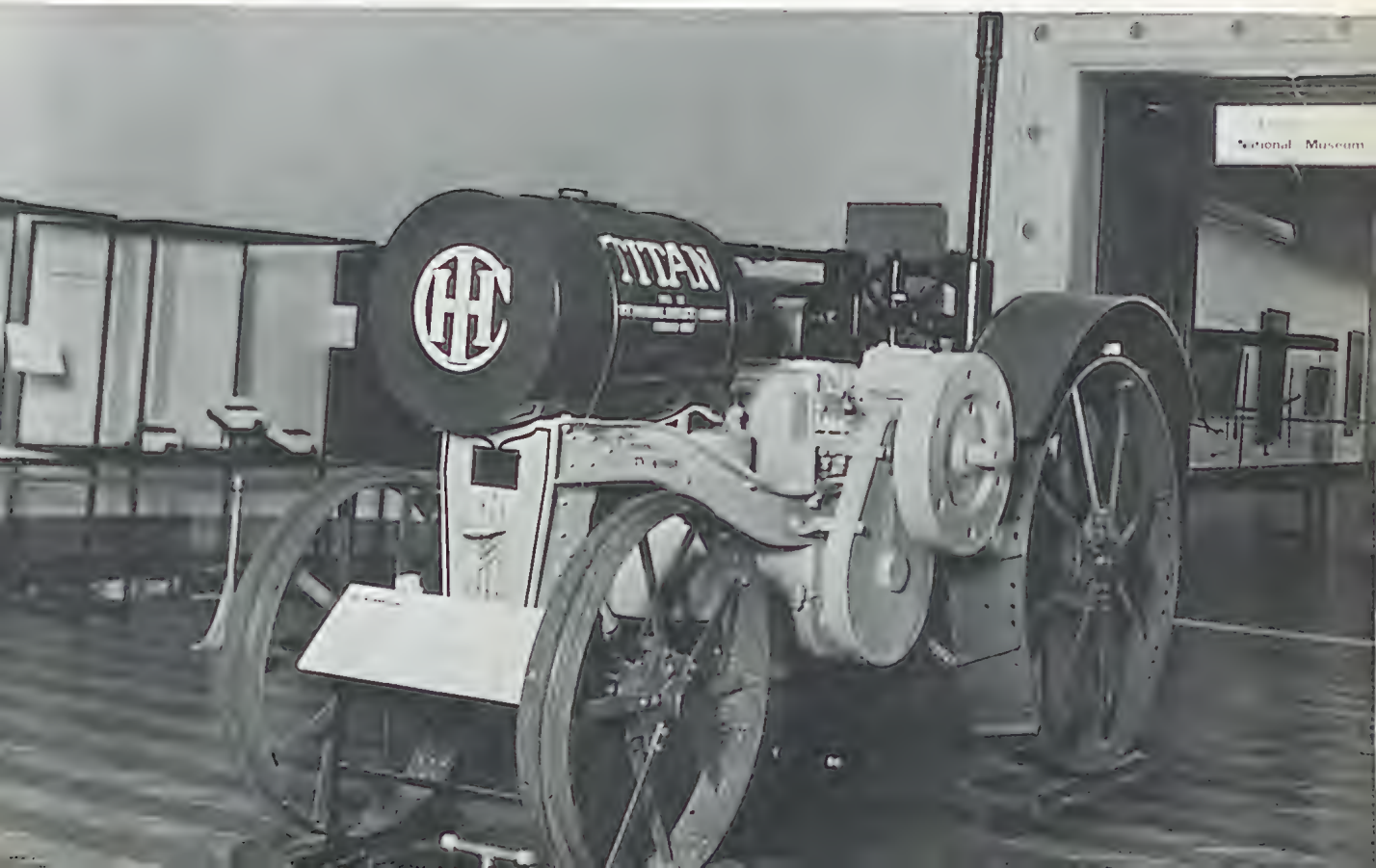


PLATE 50. The machine shop.

PLATE 51. The carpentry shop.

at this time and the collection remained his property, because eleven years later, at a meeting of the Committee of the Museum on 27 February 1941, the minutes recorded that: "Mr John Askew presented his collection of clocks, watches and other horological objects to the Institution" and that they were accepted. Mr. Askew died in December 1945, his will providing for the eventual payment annually of the sum of £400 to the Museum and for this amount to be spent exclusively on the purchase of clocks to add to its collection.[6]

In April 1928 Dr Leeper, then almost eighty years of age, declined re-nomination for the office of President of the Board of Trustees which he had held for the past eight years. The Hon. George Swinburne was then elected President to succeed him.

The Trustees, and especially the staff of the Industrial and Technological Museum, looked forward to his presidency as a period of development in which his strong personality and constructive mind would enable the Board of Trustees to face its problems with renewed hope and fresh vigour. But fate decreed otherwise. Five months later, on 4 September 1928, he died suddenly at Parliament House in Spring Street. He had been a Trustee since July 1910; soon afterwards he became Chairman of the Industrial and Technological Museum—an office he continued to hold till his death.

Swinburne was a tall, angular man who was friendly, tactful, enthusiastic and honest. His technical engineering training, his orderly mind, his grasp of detail, his wide experience in top management positions and his capacity for work made him an outstanding administrator. He was one of the Institution's most able and effective presidents, and judged by achievements he was one of the Museum Committee's most vigorous, interested and effective chairmen. His private and public interests were widespread. He enjoyed music, painting and poetry; he had an effective command of the German language for speaking and reading; he was inconspicuously charitable. In public life he had been Mayor of Hawthorn in 1902; he had been the member for Hawthorn in the Legislative Assembly of Victoria from 1902 to 1913; he was a Minister of State from 1904 to 1908; and in 1913 he resigned his seat in the Parliament of Victoria to become a member of the Commonwealth Interstate Commission then under the chairmanship of A. B. Piddington, K.C. He was a Commissioner of the State Electricity Commission of Victoria from 1919 to 1926, and for most of this time the Commission's chairman was General Sir John Monash with whom in earlier years Swinburne had co-operated with success in the movement to have the Museum re-opened after it had been closed for about sixteen years. In 1928 Swinburne became a member of the Legislative Council of Victoria and it was at one of its evening sessions that he collapsed, almost unnoticed, and died.[7]

On 14 September 1928, the Hon. Sir Leo Cussen,[8] a puisne judge of the Supreme

[6] See Minutes of Trustees' meetings on 21 Feb. 1946 and 18 June 1951, Item 8.

[7] E. H. Sugden and F. W. Eggleston, *George Swinburne: A Biography* (Angus and Robertson, Sydney, 1931), p. 489.

[8] The Hon. Sir Leo Finn Bernard Cussen, M.A., LL.B. Born 29 Nov. 1859, at Portland, Victoria. President of the Board of Trustees of the Public Library, Museums, and National Gallery from 14 Sept., 1928 to 17 May 1933. Died 17 May 1933.

Court of Victoria, was elected Swinburne's successor as President. Cussen had good technical qualifications for this office—he had been a practising engineer before he entered the legal profession.

Almost four years later, in April 1932, Mr W. D. Wilson,[9] who had been the Museum's Botanical Assistant since 1915, died after a short illness at the age of 63 years. His work, as an economic botanist, was said to have been an important contribution to the development of agriculture in Victoria and in Tasmania, but few records have been discovered to tell the story of Wilson's professional life. He was born in England in March 1869. Nothing is now known of his early education or of the schools in which he obtained it. At the age of eighteen years Wilson won a Queen's Prize in Science at an examination conducted by the South Kensington Science and Art Department.[10] It seems that in the following year he migrated to Tasmania where he entered the service of the Department of Education as a teacher. Probably in 1902 he moved to Victoria where he became a teacher of surveying in the Agricultural College at Dookie, near Shepparton and later the temporary principal of the Longeronong Agricultural College near Horsham until March 1912. In the following year, on 28 April 1913, he was appointed to the Department of Public Instruction of Victoria as an Assistant Instructor and in July 1915 he was appointed to the Public Service of Victoria and posted to the position of Botanical Assistant in the Industrial and Technological Museum at a salary of £204 per annum.

His duties at the Museum covered three areas: the identification and classification of specimens, and presumably these duties were not restricted to botanical specimens; the revising of the collections of fruit and of other botanical specimens; and general duties. When it is noted that at the time of Wilson's death the Museum's establishment provided for only two professional officers—the Director and the Botanical Assistant—and no clerical staff it will readily be seen that his "general duties" must not only have been enormous but also in many instances of a routine and time-wasting character to a professional officer. It seems that at the time of his death Wilson had a considerable amount of unpublished research work; but what became of it is not now known. Wilson was also said to have been a recognised scientific authority on fruit-growing in Australia.[11]

Mr Wilson's death caused what is known in the service as a "staff problem". When the Director, Mr Walcott, retired within a few years, there would be no professional staff with any long and wide experience of the Museum's administration and its problems. Therefore, in filling Mr Wilson's position, it was decided to change the duties and the qualifications required. In July 1932 the Trustees recommended that the duties of the position henceforth be: "to assist the Director generally in his work"

[9] William Dickinson Wilson, B.Sc.(Tas.), botanist. Born 7 March 1869 at Newcastle-on-Tyne, England. Botanical Assistant at the Industrial and Technological Museum, Melbourne from 8 July 1915 to 1 April 1932. Died April 1932 in Melbourne.

[10] This institution has since been re-organised into the Victoria and Albert Museum and the Science Museum.

[11] *The Argus*, 19 May 1932, p. 6.

and that the occupant have "a good general knowledge of mechanical and electrical engineering and preferably also a knowledge of mining and economic geology". Because of the widespread economic depression, the salary range of the position was reduced from £325-£416 nominal to £264-£336 actual.

In August 1932 the Chief Secretary's Department referred back to the Trustees their recommendation for the filling of this position. It drew attention to the government's direction that, because of the stringent financial conditions of the time, no vacant position was to be filled if such a course could be avoided. It requested to be informed if the Trustees could make arrangements in the short run to carry on without filling this appointment. The Department also wished to know the "reason for the alteration in the duties" of the position. The Board of Trustees replied to the Minute of the Chief Secretary's Department in the following terms:

> There are two professional positions only on the staff of the Industrial and Technological Museum. The death of Mr Wilson has created a vacancy, and it is essential for the adequate performance of the duties that the position should be filled. Mr Walcott, the present curator, is due to retire in about three years' time, and it is desirable that an officer having similar qualifications to those of Mr Walcott should act as understudy, and take his place on retirement. Mr Wilson assisted on the botanical side, which is not regarded as so important as the mechanical side. If the suggestion made is adopted, the new assistant would be capable of taking charge in three years' time, and a botanical assistant could be appointed when Mr Walcott retires. In the interest of the Institution Mr Walcott is prepared to carry on the botanical work himself till he retires.

The outcome was that the vacancy created by Mr Wilson's death was not filled for another two years. In April 1934 it was filled by an engineer, who resigned from the staff of the Museum two years later. In May 1936, the position was again filled by another botanist—the first to be appointed to the staff since Mr Wilson's death in April 1932.

In 1933 Mr S. F. Markham,[12] a museum authority from Great Britain, and Professor H. C. Richards,[13] of the University of Queensland, undertook a survey of Australian museums and art galleries at the invitation and expense of the Carnegie Corporation of New York. The results of their survey were later published.[14]

Mr Markham made some trenchant comments on what he described as "Melbourne's Museum Muddle".[15] He pointed out that in the dozen or so museums in Melbourne, there was more overlapping than in any other city he had seen of the same

[12] Now Sir (Sydney) Frank Markham, Kt. M.A., B.Litt. Dip.Econ., p.s.c. Born 19 Oct. 1897. Secretary of the Museums Association (of Great Britain) from Oct. 1929 to Nov. 1932; President of the Museums Association (of Great Britain) 1939-42.

[13] Professor Henry Caselli Richards, D.Sc.(Melb.). Born 16 Dec. 1884 at Melton, Victoria. Professor of Geology and Mineralogy in the University of Queensland, 1918-47. President of the Art Galleries and Museums Association of Australia and New Zealand, 1937-45. Died 13 June 1947.

[14] S. F. Markham & H. C. Richards, *A Report on the Museums & Art Galleries of Australia*. The Museums Association, London, 1933.

[15] *The Herald*, 1 Feb. 1933, p. 11.

size. One glaring example he gave was that of economic botany. There were collections in the Industrial and Technological Museum in the city; in the National Herbarium in the Botanic Gardens; in the Agricultural Museum and the Botany Museum in the University of Melbourne; and at the College of Horticulture at Burnley; but the weak point in this wide-spread multiplicity of collections was the entire absence of any kind of organised co-operation between any of the institutions concerned. A student of economic botany, to achieve the maximum knowledge of the subject, had to pay time-wasting visits to four or five institutions, none of which contained any indication of the location of similar collections in the city. The same criticism applied, Mr Markham added, if not quite so strongly, to certain mineralogical and geological collections. He thought that the Industrial and Technological Museum was much overcrowded and that it would be "difficult to find another museum of its type quite so confusing on this account".[16] Unfortunately, the Markham and Richards official report was much more restrained than Mr Markham's interview with the press, and it was more general in its comments.

This official report pointed out many things which are of interest in comparing Australian museum administration then with that of today. According to the report, dated 1933, less money was spent annually on museums in the whole of Australia than in Scotland; and a single large museum in London had from five to six times the income of all Australia's museums and art galleries put together.

The report drew attention to a desire of the Trustees to improve and develop the four branches under their charge in 1929. The heads of the Industrial and Technological Museum and of the Public Library, the National Museum, and the National Gallery were asked to submit recommendations for improvements in loan and exchange methods, recruitment and staff establishments, allocation of space, in the production of publications, in facilities for conducting research, in providing services to the public and in any other matters which would be of benefit to the Institution or would increase its utility to the public. The report said: "It was a chance at which any curator would have leapt! To be invited to record in black and white their dissatisfaction, their hopes and ambitions, as far as they appertained to their particular institution . . . was to say the least of it, a great opportunity." But it was during the great depression and the report recorded that: "It is distinctly unfortunate that most of the proposals involving even a small expenditure had to be postponed to the Greek Kalends on account of the financial situation".

The report made some general observations of importance on staff:

> Most of the existing directors or curators of the larger museums are men who were originally trained in other professions, such as librarianship, journalism, mining engineering etc. . . . There are, however, a few who have had their early training in museums. But one and all have had singularly little opportunity, so easily secured by their European or American confrères, of seeing other museums at frequent intervals.

[16] *The Herald*, 27 Jan. 1933, p. 12.

The report also pointed out that in this matter the Curators' difficulties were often accentuated by their boards of trustees or by government departments which were rarely aware of the real necessity for the continuous interchange of opinion between experts which was an essential condition of progress.

Whatever may be said nowadays of other similar Australian institutions it cannot be said of the Institute of Applied Science of Victoria that its Board of Trustees is not sympathetic to the professional staff visiting other similar organisations in Australia and overseas to widen their knowledge and experience. During the past twenty years one Director and one Deputy Director have made extensive tours of overseas museums to study the latest developments in museum organisation and administration, recruitment and training of staff, and methods of lighting and displaying exhibits for public inspection. Travel within Australia to attend conferences, consult colleagues, and to examine developments in other states is a commonplace matter today.

Another important observation made in the Markham and Richards report was the following:

> Generally speaking the staffs of the larger Australian museums have a distinct bias towards research work as contrasted with exhibition work. To a great degree this tendency, in a country where so much remains to be investigated in the realm of science, is understandable. But the public (who after all foot the bill) judge a museum by its exhibited collections and not by articles appearing in scientific journals, and a little more attention to the purely educational side of museum activities would appear to be desirable.

To strengthen these remarks, the report quoted from *A Report on the Museums of the British Isles* which said:

> The Curator should be a fountain of inspiration. He should be accessible to inquirers (some of the most competent have to answer hundreds of inquiries during the month), and he should make his museum a meeting-place for various clubs and societies, an encouragement to all seekers after knowledge, and an educational centre for the town or province.

These uplifting remarks are again general; they were not directed at any particular museums. But one thing that we can be certain about today is that their application to the Industrial and Technological Museum in 1933 would have been wholly unrealistic. The Director, Mr Walcott, was the sole professional member of the staff of the Museum which was also without any clerical staff. Whether Walcott's bias was towards research or making the Museum attractive to the visiting public was an irrelevancy. He had no alternative in practice but to "keep the ship afloat" and moving by any means he could grasp. This was an ideal example of wasting entirely the services of a professional officer by making him exhaust himself daily on lower grade non-professional work. What was the purpose of this? It was to save a few pounds in salaries of non-professional officers and thereby waste the Director's time by compelling him to spend it on non-professional work which a subordinate should have done.

In a memorandum, dated 26 May 1933,[17] Mr Walcott pointed out that the Museum's staff position in 1933 was worse than it was in 1893, and he also stated that:

> Owing to the meagre staff, both the last Assistant, Mr Wilson, and myself have had to do work which did not require professional knowledge, and which took up a considerable amount of time, thereby diverting us from our legitimate and more important duties, and depriving the Museum of the full value of the professional staff.

The Markham and Richards report also made some pertinent remarks on "Buildings and Equipment". The authors said in effect that in the course of their tour they were considerably surprised at the lack of museum buildings which had been built for the purpose and were adequate for housing collections. With the exception of Canberra, there was hardly a museum building in Australia that could have been regarded as up-to-date from the point of view of lighting, fire prevention and staff accommodation. In many the lighting was unsatisfactory, and reflection was at its maximum.

Although these remarks were general and they were not aimed at any particular museum, they were, unlike those on staffing, applicable in their entirety at that time to Victoria's Industrial and Technological Museum. In the hundred years that has passed since it opened in 1870 it has never had a separate building of its own. During this period it has always occupied part of the group of buildings which has invariably been regarded by the public as buildings of the Public Library of Victoria. The report recorded that throughout the whole of Australia there appeared to be no museums, outside Victoria and New South Wales, devoted solely to technology. The report also pointed out that while the Technological Museum in Sydney was congested the Industrial and Technological Museum in Melbourne was even more overcrowded. Mining collections, it was noted too, were usually displayed, spatially speaking, to the disadvantage of agricultural collections. However, the report qualified this generalisation by indicating that the technological museums in Melbourne and Sydney were striking exceptions.

Some pertinent remarks were also made on scientific publications. "The record of scientific investigation and of the subsequent publication of the results is a worthy one and might be regarded as one of the most pleasing features associated with museum activities". The Australian Museum in Sydney led the way in this direction but in all Federal and other State museums the scientific staffs had "not been unmindful of their obligations in this respect, and in most cases much well-sustained and well-directed enthusiasm has been displayed". This comment was over-polite and somewhat misleading in so far as the Industrial and Technological Museum was concerned. Its professional staff had little, if any, time or facilities, during the period covered by the report, for conducting research work. Moreover, the number of scientific journals published in Australia at that time was so few that opportunities for Australian scientists to publish the results of their research locally were limited.

[17] From the Director to the Secretary to the Board of Trustees on the subject "Vacant Position of Professional Assistant, Technological Museum".

This report was a useful record, where none had hitherto existed, of the administrative problems with which museums in Australia, with inadequate staff and money, had to cope. Makeshift means had often to be resorted to, for purposes of maintenance and development, by employing part-time and honorary workers in specialised fields. The services of these workers have been of considerable value in the Industrial and Technological Museum in maintaining services and collections which might in other circumstances have had to be abandoned.

The Trustees and the members of the Committee of the Museum had been trying intermittently and unsuccessfully for years to solve the Museum's insatiable demands for more space by looking at prospective sites in other parts of the city for a new building. The repeated efforts to accommodate the Industrial and Technological Museum in a building of its own were reviewed, on 21 September 1933, at a meeting of the Committee of the Museum by the Committee's chairman, Alfred E. McMicken.[18]

The history of this failure began in 1883 when the Board of Trustees, at its meeting on 28 May, declined the proposal of the Trustees of the Exhibition Building in Nicholson Street, Carlton that the Museum be transferred to its building. In August 1900 a deputation of the Trustees, the Council of the Working Men's College and others protested to the Minister of Public Works against the proposal to erect a new police court building at the corner of La Trobe and Russell Streets. The deputation expressed the view that after the law courts building, then standing on the site, had been demolished the site should be used for the erection of a building to accommodate the Industrial and Technological Museum. In September 1904, there was a further deputation to the Premier, the Hon. Thomas Bent, urging that the law courts building be replaced by a new building to accommodate the Industrial and Technological Museum. But the Government finally decided to retain the site for a new law courts building. The foundation stone of the present building on this site was set on 20 July 1911 and the building was formally opened, on the 20 January 1914 by the Lord Mayor of Melbourne, Councillor D. V. Hennessy.

The Trustees, therefore, had to look elsewhere for a suitable site for a new building for the Industrial and Technological Museum. A decade later, on 3 October 1924, a deputation led by the President of the Board of Trustees, Dr Leeper, called on the Premier, the Hon. G. M. Prendergast, and asked that a new site be made available for the Museum. A number of alternatives were suggested, including a portion of the old Melbourne Gaol site in Russell Street and the old Police Barracks area in Russell Street (which are today occupied by part of the present Police Headquarters). The Premier gave the routine answer that he would consider the matter, and nothing came of it.

On Thursday 15 December 1932 the problem of a new site was brought up again at the Trustees meeting in connection with the proposed removal of the Royal Melbourne Hospital to a new site. The Trustees decided to send a letter to the Premier

[18] *The Age*, 23 Sept., 1933, p. 19.

to request that in the disposal of the site then occupied by the Hospital a part of it be reserved as a new site for the Industrial and Technological Museum. These and other later efforts were of no avail.

The Museum was still in the same building when the time came, in September 1935, for Mr Walcott to retire from the duties of Director, which he had discharged for the previous forty years. He had, in fact, spent the whole of his professional life on the staff of the Museum and in this building. During his long service Mr Walcott had been obliged to acquiesce in much that he was unable to either prevent or change. He had been endlessly painstaking and unalterably patient in the discharge of his duties in an environment that provided practically nothing in the way of either facilities for staff development or opportunities for promotion. Mr McCallum[19] recalled Mr Walcott recently as "a tall, slim man with a moustache who looked at the world, quietly and unassumingly, through thick glasses".

After Mr Walcott's retirement Mr L. R. Ninnis,[20] who had been employed on the Museum's staff since the 9 April in the previous year in the capacity of Professional Assistant,[21] became the Acting Director. Mr Ninnis' appointment to the position of Director, in the salary range £384-£516, was confirmed in December 1935. This salary range was lower than that which Mr Walcott had enjoyed in the position at the time of his retirement but Mr Ninnis did not remain in the position for long. In the following month he resigned to take up another position in the State Electricity Commission of Victoria.

The Museum's next Director was Mr E. H. Penrose[22] who had been a permanent officer of the Public Service of Victoria since 12 June 1908. He was promoted to the position from that of draughtsman in the Department of Public Works. He commenced duty on 24 February 1936, in the same salary range as his immediate predecessor.

In the year following Mr Penrose's appointment an important development in museum administration occurred when the Art Galleries and Museums Association of Australia and New Zealand was formed in January 1937. It is still a flourishing association but its designation has since been changed to that of the Museums Association of Australia.

This association was the outcome of financial assistance given to Australia and New Zealand about four years earlier by the Carnegie Corporation of New York. These grants had made possible the Markham-Richards survey of the museums and art galleries of Australia and New Zealand. Then in 1936, the Corporation announced

[19] Mr Colin Alexander McCallum, B.A.(Melb.), retired officer of the Public Service of Victoria. Born 15 Sept. 1895. Chief Librarian of the Public Library of Victoria from 29 April, 1946 to 15 Sept. 1960.

[20] Mr Leonard Royce Ninnis, B.C.E., B.E.E., M.I.E. Aust. Born 6 Oct. 1908. Director of the Industrial and Technological Museum of Victoria from 4 Dec. 1935 to 7 Jan. 1936.

[21] This appointment of "Professional Assistant", although its title did not suggest it, was the second senior one on the staff of the Museum.

[22] Mr Edgar Howard Penrose, C.E., retired officer of the Public Service of Victoria. Born 1 Jan. 1886. Director (officially Curator up to 1946) of the Industrial and Technological Museum 11 Feb. 1936 to 16 March 1945 and of the Museum of Applied Science of Victoria 16 March 1945 to 1 Jan. 1951.

that it would make further grants to Australia and New Zealand to experiment with methods which would make their museums and art galleries of greater educational value to the public.

An exploratory conference of directors of museums and art galleries of Australia and New Zealand met in Melbourne in 1936 under the chairmanship of Professor H. C. Richards, its object being to consider ways and means of increasing the educational value of these institutions. The Director of the Industrial and Technological Museum, Mr Penrose, was among those who attended, and it was at this conference that it was decided to establish the Association of Art Galleries and Museums.

The inaugural meeting of the Association took place at the War Memorial Museum in Auckland, New Zealand and it was spread over a period of three days—13, 14 and 19 January 1937. A draft constitution was adopted and office bearers were elected. The meeting elected Professor H. C. Richards of the University of Queensland to be the Association's foundation president. Melbourne's Industrial and Technological Museum did not send a representative to this inaugural meeting and so no member of its staff was elected to the Association's original panel of office bearers. This was another opportunity the Museum missed.

For the first decade the Association did not produce a journal. Then, at its first post-war conference in Melbourne in August 1946, it was decided to publish a news bulletin. The first issue, entitled *A.G.M.A. News Bulletin*, was published in February 1947. From the outset it was more than a newsletter dealing with matters of current but ephemeral interest. It was in fact a combination of a newsletter and a professional journal.

This publication seemed to be the most practical means of keeping members of the Association informed of activities in museums and art galleries in Australia and New Zealand. In the second issue, dated August 1948, Mr R. H. Fowler of the Museum contributed a short paper entitled "Antique Finish on Gilt Picture Frames". In the July 1953 issue Dr Focken, the Director of the Museum, contributed a paper entitled "The Audiometer: New Exhibit for Hearing Tests". His Deputy Director, Mr R. H. Fowler, contributed a paper to the same issue entitled "Aids for Large Lettering". In the March 1955 issue Dr Focken contributed a short paper entitled "The Radiocarbon Dating Method"; and in the July 1959 issue, Mr J. C. Liddy, the Physicist of the Museum published a paper entitled "A Museum looks at Atomic Energy". In that same issue of the *Bulletin*[23] one of the joint honorary editors was shown to be an officer of the staff of the Museum, Mr R. H. Fowler. It will be clear that the staff of the Museum assisted materially in making the Bulletin a useful source of professional information for members of the staffs of Australia's museums.

Nevertheless, this *Bulletin* was not an ideal one in all respects for meeting the purposes for which it was being published. Its format had unsuitable features but these could have been remedied by a larger membership which would have provided

[23] Consequent on a change of the Association's title to Museums Association of Australia the title of the *A.G.M.A. News Bulletin* was changed to *M.A.A. New Bulletin*. Except for a shift in emphasis away from art gallery matter, the bulletin's continuity was unaffected.

more money for the production of a better journal. It did however provide the professional and administrative staffs of Australian museums with a means for publishing short papers on subjects of interest. It was a journal which they could regard as their own and made them less dependent on overseas journals for the publication of their work. Despite editorial perseverence and adequate financial support the *Bulletin* ceased publication after its twelfth issue, in 1963, because of the failure of members to supply in quantity articles of the required quality.

About eleven years earlier, on 17 October 1952, the Association had begun to publish a quarterly newsletter also, entitled *Kalori*. Unlike the *M.A.A. News Bulletin* it was, in its earlier issues, exclusively a newsletter. But by the early 1960's *Kalori* had also become a combination of a newsletter and a professional journal. Since January 1967 the Deputy Director of the Institute of Applied Science, Mr F. J. Kendall, has been associated with the printing and distribution of *Kalori* in his capacity as the Association's honorary Secretary-Treasurer.

In 1938 attention was directed to the Industrial and Technological Museum from another quarter. Two critical feature articles on "Our Technological Museum" were published in *The Age* in March of that year.[24] The first article began by asking a number of pertinent questions. Did Melbourne's Industrial and Technological Museum adequately fulfil the purpose for which it was founded? Was it playing the part in promoting technical education that it was intended originally that it should? Was it worthy of a city of more than a million people—the capital of one of Australia's most highly developed and richly endowed states? The article answered each of these questions in the negative. Then it proceeded to give a critical analysis of the Museum's problems. The Museum might have met all these requirements forty years earlier. But by March 1938 it had fallen sadly behind the times. During these four decades its value as an educational institution had declined seriously and this decline had reflected no credit on a wealthy industrial city of Melbourne's size.

The article's criticism took a comparative turn at one stage and said that most other great cities of the world had been quick to grasp the significance and potentialities of the museum as an educational institution. The great Deutsches Museum in Munich with about nine miles of exhibits was an outstanding example. Berlin had about 56 museums, and among these technological museums predominated. Great Britain did not lag far behind Germany. In such places the person interested in, say, mining could operate a rock drill instead of merely having to gaze at drab and inanimate models with dull and faded labels. Other phases of industry were displayed in these overseas museums with equal thoroughness. At the South Kensington Museum in London full-sized locomotives could be seen; and other branches of applied science in industry were dealt with on a similarly grand scale. The Imperial Institute[25] at South Kensington in London was devoted to unique and fascinating displays collected from all parts of the British Empire. Expansive and faithful dioramas were freely

[24] *The Age*, 15 March 1938, p. 10, and 22 March, 1938, p. 10.

[25] Today known as the Commonwealth Institute, South Kensington, London.

employed to illustrate as effectively as only they could, various aspects of industrial activity, both primary and secondary. What a contrast these institutions made for students of applied science with Melbourne's uninteresting and archaic Industrial and Technological Museum.

The article concluded rather despairingly, that with few exceptions Melbourne's Industrial and Technological Museum was entirely inadequate to meet the needs of the day, and did little more than provide the venue for those who sought to amuse themselves idly for an hour or so. Then it ended, as it began, with a question: "Is it possible that Melbourne can manage nothing better than this?".

The second feature article maintained the brisk fire of criticism; but it also made some suggestions for improving and modernising the Museum. It began with an important statement, which seemed to have escaped the notice of critics for far too long. It seemed that those in control of the National Gallery of Victoria and its allied branches of the Institution had generously bestowed their interests and attention upon the wide field of art at the expense of the more practical but hardly less important applied sciences.

By way of explanation it added that this was probably accounted for by the liberality with which the National Gallery had been endowed and the ability of the Trustees to purchase works of art of unquestioned value in astonishing numbers. The generous Felton Bequest that had enabled Melbourne to purchase objects of art coveted by many of the world's other great cities was of such magnitude that each year the Trustees were able to add more and yet more treasures to the National Gallery of Victoria's already magnificent collection. Each year more space was required to accommodate them and the writer saw in this circumstance no prospect of relief from the Technological Museum's own accommodation problems under the prevailing Trustees' attitude. He would have been fortified in this view if he had looked back to the turn of the century when the Trust deprived the Industrial and Technological Museum of all its display area.

In the composition of the Board of Trustees, the article pointed out, there was a lack of men whose active interest lay in the various other fields for which the Board was responsible.[26] An example of this was afforded at the time, by the Board's decision to reduce further the Industrial and Technological Museum's space by the replacement of agricultural exhibits in the Barry Gallery with water colours and coins.[27]

The article then pointed out that these observations were not intended to suggest that the aesthetic development, which works of art made possible, was unimportant. Their object, on the contrary, was merely to indicate that the technical branches of

[26] For a list of members of the Board of Trustees of the Public Library, Museums and National Gallery for 1938, see Annual Report of the Trustees, 1938.

[27] The annual report of the Industrial and Technological Museum for 1938 said: "The surrender of the Barry Hall Gallery emphasises the inadequate and unsuitable accommodation provided for the Industrial and Technological Museum; and unless further accommodation can be made available it will be impossible to continue to make the Museum fulfil the purpose for which it was founded, that is, to maintain a museum of science and industry where progress can be set out for all to see and study". See Annual Report of the Trustees, 1938, p. 79.

education were being heavily discounted. This discounting, it said, was being made at a stage in Australia's development which demanded that the cultural and the technological aspects of this development should march forward together. One should not develop at the expense of the other.

The article then turned its fire on to the composition of the Board of Trustees itself. It pointed out that the first essential in restoring the Industrial and Technological Museum to its proper place in the community was to introduce new men into the ranks of the Trustees. Men were wanted there, it said, with an appreciation of the Museum's importance to the community and in particular to its role in the promotion of industrial and technological education. Experts in various branches of applied science, if appointed to the Board of Trustees, might change the Board's attitude to the Museum and a change in its favour was long overdue. By the efforts of such new Trustees the public's interest in the Museum, and in particular that of the industrial community, might be revived.

The eternal problem of space was then referred to. Since lack of sufficient space was the greatest influence operating against the Museum's development, the best remedy was to accommodate the Museum in its own building. This building could be obtained in two ways. One was the provision of sufficient public funds by the government to erect or otherwise obtain a suitable building. The other was to obtain funds by public subscription.

At a meeting of the Committee of the Industrial and Technological Museum on 31 March 1938 its chairman, Mr A. E. McMicken, drew the members' attention to the two articles which *The Age* had published on the Museum. The President of the Board of Trustees, Dr A. S. Joske, who was present at this meeting, commented on Mr McMicken's remarks. It was surprising to read in *The Age* the next morning that Dr Joske had been reported as having said in effect that gratitude was due to the newspaper for having drawn the public's attention to the Museum as the "Cinderella" of the Institution and unworthy of a city of Melbourne's size and importance. Dr Joske seemed to have missed the point that the criticism by *The Age* was as much a criticism of the Board of Trustees as it was of the government.[28] Dr Joske had also moved a motion, which was carried, to the effect that the matters raised in *The Age* be referred to a special committee of the Museum for investigation.[29]

The special committee met on 8 April 1938, and left the task of writing and signing its report to the Director of the Museum, who was a public servant and so much less free to criticise than the members of the committee. The Director submitted the report,

[28] *The Age*, 1 April 1938, p. 10. The official minutes of the meeting are less informative than this newspaper report.

[29] According to *The Age* report, a letter was read at the Committee meeting on 31 March 1938 from Sir David Rivett, a Trustee who was absent that day at the Annual Conference of the Chamber of Agriculture at Warracknabeal. In this letter, he pointed out, firstly, that he did not believe that the Museum was adequately fulfilling the purpose for which it existed, and secondly that it was "deplorable that the trustees should be forced to carry on with a mere £600 Government grant for the expenses of the Museum, apart from salaries". He added: "The Museum is not a credit to the State" and "the specimens are set up with a process now quite antiquated".

dated 14 April 1938, to the Secretary of the Board of Trustees[30] and he signed it as the Director of the Museum and not for and on behalf of the special committee which had given him the task of writing it.

By this short-circuiting of the Committee of the Industrial and Technological Museum, through the submission of the report direct to the Board of Trustees, the chairman of that committee was relieved of the duty of adding to the report any comments that the Committee of the Museum might have wished to make before it went on to the Board of Trustees. It could be said in defence of the Director's misdirection of the report that all members of the Board of Trustees were *ex-officio* members of the Institution's four branch committees. But this comfortable and club-like administrative arrangement only served to illustrate, in the most glaring way over the years that it operated, that what was everybody's business was nobody's business. When its administration is looked at in this way it is not surprising that the Industrial and Technological Museum—perhaps the least glamorous of the Institution's four branches—hastened slowly between one period of stagnation and another.

The report read more like a reply or a rejoinder from an official rather than the considered report of the special committee consisting of trustees:

> I desire to submit the following reply to articles published in *The Age* newspaper of March 15th and 22nd in which it is stated that the Industrial and Technological Museum is not adequately fulfilling the purpose for which it was founded.

The Director then went over to the royal singular in referring to the Museum's plight in the matter of inadequate accommodation and insufficient monetary support for maintenance and developmental purposes.

> We do not claim that the Museum even approaches the standard that is desired. We have endeavoured to build up an institution of science and industry, but through the inadequacy of accommodation and funds it is impossible to make the progress that we desire.
>
> In a memorandum furnished to the Trustees in May 1929 the late Curator said: "The existing accommodation is entirely inadequate and unsuitable; consequently it is impossible to make a proper arrangement and classification of the exhibits, space having to be obtained wherever it can, sometimes regardless of the nature of the objects. While these conditions exist no suggestions can be offered for an improvement in the arrangements of the exhibits or allocation of space". Since that statement was made over three thousand exhibits have been registered. The present Curator has, since his appointment in February 1936, placed on exhibition over 826 individual exhibits.
>
> It is obvious to the most casual eye that restriction of space has become a serious obstacle to further logical development. The following alternatives now present themselves:
>
> (a) Further additions of modern developments of subjects already repre-

[30] The Secretary of the Board of Trustees had a position like that of the German Emperor who was always King of Prussia; the Secretary of the Board of Trustees was after the time of Marcus Clarke, always the Chief Librarian of the Public Library of Victoria. The independent and quite distinct functions of these two posts were always confused by his use in Board of Trustees' correspondence of the bewildering title of "Chief Librarian and Secretary".

> sented must be drastically restricted in order to retain in position the collections made in the past.
>
> (b) Modern developments can be added by discarding the old exhibits.
>
> The ideal procedure is to retain the older exhibits and also represent modern developments as they occur. It is only thus that the Museum can fulfil its true mission of illustrating the growth and development of science and industry.

The Director pointed out that his activities were confined to a "difficult compromise between the above alternatives", adding that: "Almost invariably when new exhibits are to be accommodated, a complete reshuffle of the section concerned is necessary, and in many cases either old exhibits must be removed to storage, or a considerable degree of crowding must be carried out".

The report then referred specifically to the criticism which had been directed at the Museum by *The Age*:

> In the light of the foregoing observations it is evident that *The Age* criticisms are, from a broad aspect, justified. Certain individual observations in the articles are, from our point of view, exaggerated, but they hardly affect the main issue. Many of the suggestions for popularising and modernising the presentation of exhibits are commendable, but can hardly be considered practicable under the present conditions of crowding without discarding old exhibits to a considerable degree, and with the present restriction of finance.

The writer's experience obviously made him fully aware that the development of processes and apparatus can best be presented and comprehended by displays that set forth the original methods followed by the progressive steps in their historical development, and that in addition to presentations of this kind through full-sized specimens or models, every resource provided by descriptive labels, diagrams, plans, coloured representations and statistics should be exploited to bring out the ideas and principles involved with the maximum of clarity. The report made it plain that the Museum was inadequately provided with these resources.

The comment on the inadequate provision made for the Museum's financial support made painful reading:

> Our annual vote which was drastically reduced to £350 is almost invariably earmarked in each financial year for case construction and a very few special exhibits.
>
> This leaves us practically no opportunities for activities other than routine display work, and hinders us from keeping up with modern developments of science. It also prevents us from engaging in the many popular activities which should be regarded as an important part of the true mission of every active museum.

The report then referred to specific handicaps of the Museum in conducting its "many popular activities". It had an urgent need for descriptive literature such as Museum guide publications. It said that: "The last catalogue (which concerned only the Timber section) was issued in 1894"—forty-four years earlier! The Museum's photographic equipment was inadequate: "Much important photographic work is done with the most meagre, and generally borrowed equipment" and this constituted

"a very grave handicap in the production of effective results". The Museum's laboratory facilities were even more discouraging:

> The staff is working under very grave disabilities in carrying out necessary work for the Museum. The making of wax and plaster models, preparation of preserving solutions, botanical section cutting, and many other operations apart from the testing of specimens submitted by the public, are all carried out under extreme handicaps. There is not even a single room provided with gas, water and sink.

This situation was bad enough but it was not all. The report stressed that the staff situation "requires urgent attention". Then, as evidence, it made the almost incredible statement that: "The Director has only one professional assistant to assist in the carrying out of all administrative, clerical, stenographical and technical activities". The report finished with a reference to the eternal problem of space:

> The provision of a new building is the only permanent and logical solution of the deadlock which confronts the Museum's administration. In the event of such provision being made, a building with a floor capacity of at least 60,000 square feet, with room for expansion would be desirable. The effective floor area of the Queen's Hall and Gallery is approximately 15,000 square feet. To display the present number of exhibits in such a way as to eliminate the existing state of crowding would require double the floor area, whereas a total of 60,000 square feet should be provided to allow reasonable future development.

This report, although it was signed by the wrong authority and was submitted by that authority through wrong channels to the wrong higher authority, found its way back in due course to the Committee of the Industrial and Technological Museum. It became an item of business at its meeting on 28 April 1938, but this meeting's minutes record no major decisions on the report, only two minor ones. These were: first, "Referred to Industrial and Technological Museum Special Committee"; and second, "Curator's report made available for press". No reason was given for the first decision so it is not known what this Special Committee was directed to do with the report. With regard to the second decision one result was a commentary on it in *The Age* on 29 April 1938 which said that the "report by the Curator (Mr E. H. Penrose) supports *The Age* contention that the Industrial and Technological Museum is not fulfilling its function". These two articles in *The Age* constituted one of the most trenchant criticisms of the Museum's administration that had ever been published.

But preparations for a fast approaching second world war again deflected attention for another decade from the Museum's inadequte accommodation and the plight of its overworked staff—a staff which was inadequate both in numbers and in skills to do the various daily tasks of the Museum effectively.

The contention of *The Age* was strengthened two months later by an incident embarrassing alike to the Museum and to others concerned. In June and July 1938, three Thursday afternoon lectures were to be delivered to the public in the Museum. The lectures were advertised to begin on 16 June with Professor Laby's[31] lecture

[31] Later Emeritus Professor Thomas Howell Laby, M.A.(Melb.), Sc.D.(Cantab.), F.R.S., F.Inst.P. Born 3 May 1880. Professor of Natural Philosophy in the University of Melbourne, 1914-44. Died 21 June 1946.

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entitled "The Life and Scientific Work of Lord Rutherford". But Professor Laby subsequently refused to give this lecture. He explained the reasons for his decision in the following letter which was published in *The Herald* on the day before the lecture was to have been given.

> Might I ask to be allowed to explain to those who intended to attend the lecture which I was to have given tomorrow on "The Life and Scientific Work of Lord Rutherford" why I have asked the trustees of the Technological Museum to cancel it.
>
> When, after some discussion with the Curator of the Museum, I proposed the above subject, I did so with a desire to pay a tribute to a great scientist and in the belief that I would be able to give the lecture under conditions which would be fitting for such a tribute, and with means for showing lantern slides and experiments which would illustrate the scientific discoveries of Lord Rutherford.
>
> I regret that I did not check these assumptions until Saturday, when I found that the Museum had not a lecture room, that the lecture was to be given in a bay of the Technological Museum, in which the audience and lecturer would be subject to interruption, in which it would not be possible to show lantern slides, and if space were taken for experiments, there would be no space for an audience.
>
> The lecture has been cancelled and I ask for those who intended to be present to accept my apology, in so far as I am responsible for what has happened.

Proof was overwhelming of the Museum's inadequate space, the insufficiency and obsolescence of its equipment, its financial neglect, and its urgent need for clerical staff and more professional staff.

Chapter 8

During the Second World War (1939-45)

After the opening of the year 1939 it soon became obvious to the Museum authorities that the Museum would in the near future soon enter a period of wartime conditions for the third time in its existence.[1] The long period of anxiety which Hitler had built up systematically throughout the world by his policies of external aggression and internal oppression was ended so far as Australia was concerned on the 3 September 1939 when Great Britain declared war on Germany for the second time within a quarter of a century.

Two days after the outbreak of this war, the President of the Board of Trustees of the Institution, Dr Joske,[2] died. He had been a Trustee of the Institution since 1903; he was a prominent figure in the medical profession of Victoria; and he had been President of the Medical Board of Victoria since 1915. A new President had to be elected without delay. This was done later that month on the 21 September. Sir Keith Murdoch[3] became the new President of the Board of Trustees; and the position of Vice-President which he vacated was filled by Dr John Fullarton Mackeddie, M.D.

The Museum was soon able to assist Australia's fighting services in a variety of ways. Organised parties from the Army and the Air Force visited the Museum at frequent intervals for instructional purposes.[4] Exhibits were lent by the Museum for display purposes connected with recruiting campaigns. Weapons and other warlike equipment were also lent to Commonwealth Government authorities for recruiting displays and to study in connection with the designing and producing of new patterns of arms and equipment.[5]

Japan's attack on Pearl Harbour and its invasion of the territory of what is today known as Malaysia early in December 1941 brought Australia into the war on another

[1] The South African War, 1899-1902; the War of 1914-18; and the War of 1939-45.

[2] Dr Alexander Sydney Joske, O.B.E., J.P., M.D., ChB. Born 10 Jan., 1863. Member of the Board of Trustees of the Public Library, Museums and National Gallery of Victoria from 21 July, 1903 to 5 Sept. 1939; President of this Board of Trustees from 28 Oct. 1937 to 5 Sept. 1939.

[3] Sir Keith (Arthur) Murdoch, Kt., journalist, war correspondent and company director. Born 12 Aug. 1886, Melbourne, Victoria. Chairman of the Board of Trustees of the Public Library, Museums and National Gallery from 21 Sept., 1939 to 15 March 1945. Died 4 Oct., 1952.

[4] Annual Reports of the Trustees, 1940, p. 50; ibid 1942, p. 56; ibid 1945, p. 47.

[5] Annual Report of the Trustees, 1941, p. 52.

front, closer to home, and for some time after the fall of Singapore in February 1942 Australia stood in imminent danger of invasion by Japanese forces. It became doubly imperative therefore in these circumstances for the Museum to co-operate with Australia's fighting services in any way practicable to further the war effort.

But this co-operation was not always peaceful in character. A letter from Headquarters, Southern Command, dated 31 December 1941, to the Secretary of the Board of Trustees said: "With reference to the 5 machine guns and parts held by the Technological Museum, received from the Australian War Museum, you are advised that the Australian Military Authorities, desire to impress these weapons for conversion". In the minutes of the meeting on Thursday, 5 March 1942, of the Committee of the Industrial and Technological Museum it is recorded that: "The Executive Committee reported that at its meeting on February 3, 1942, it was decided to protest against the proposed impressment by Southern Command of five machine guns[6] for purposes of conversion". But the Secretary to the Board of Trustees reported that "Southern Command had since informed him that the Trustees request for exemption from impressment could not be acceded to" and so "It was resolved to hand over the machine guns".

However, the Museum's contribution to the war effort was not limited to weapons and warlike stores and the conducting of classes of instruction for members of the fighting services. Even a senior member of the Museum's professional staff was lent, by direction of the Director General of Manpower, to the Commonwealth Department of Munitions in June 1942 for "the duration". This officer was Mr Fowler[7] who is today the Director of the Institute of Applied Science. He is essentially, by training and disposition, a man of peace but the circumstances of war decreed that he should "disguise fair nature with hard favoured rage" and so he joined the scientific staff in the Fuze Section of Explosive Factory No. 1 at Maribyrnong in Victoria. Because of his chemical qualifications and his experience in the Chemist's Branch of the Department of Agriculture he was engaged in experimental work connected with the production of fuzes and detonators. Later he became officer-in-charge of investigational work in the Fuze and Detonator Sections. These duties included research work to improve fuze designs and the compilation of process sheets and the production of manuals of approved factory practices.

Transfer to essential war work was a common enough occurrence at the time. But, in so far as the Museum itself was concerned, his departure demonstrated again the futility of trying to maintain, at a reasonable standard of efficiency, the Museum's services to government departments, industry and the public without sufficient staff. Mr Fowler's transference to urgent and essential war work reduced the Museum's professional staff to one officer—the Director himself. This desperate situation, how-

[6] This figure of five was an error. Three machine guns only were surrendered by the Museum in this instance—a Lewis Gun, a German heavy machine gun and a German light machine gun.

[7] The Public Service Board of Victoria approved of Mr R. H. Fowler, the Assistant (Botanical) of the Museum, being lent to the Commonwealth Department of Munitions from the 29 June 1942 for "the duration of the war". He ceased duty in this Commonwealth Department on the 29 June 1945, when he resumed duty in the Public Service of Victoria. See Annual Report of the Trustees, 1942, p. 56.

ever, was less a consequence of war than a lack of vision in staff planning and recruitment before the outbreak of the war. When Mr Fowler left the Museum in June 1942 his biological work came almost to a standstill until he returned to it three years later. There was in fact nobody on the Museum's staff to whom he could hand over his duties. The Director, Mr Penrose, was an engineer, but even so there was a limit, quantitatively, to the amount of work he could do in addition to his own. Obviously the Museum's biological work suffered greatly during Mr Fowler's absence. The building up of the collection of type specimens of plant pathology ceased; and the amplification of the collection of fruit varieties had by necessity to stop also. This situation can, of course, be regarded as one of the real costs of war. But the point here is that planning and foresight could have reduced these particular costs.

During the course of the war an important change was made in the organisation of the Institution's top level administrative machinery. This change was initiated at a meeting of the Trustees on 27 August 1942 when the following motion, moved by the Vice-President, Dr Mackeddie, was carried:

> That, in the opinion of the Trustees, it is desirable to abolish the three sectional committees—the Public Library Committee, the Industrial and Technological Museum Committee and the National Museum Committee—and to merge the business now transacted by them into the business of the Trustees meetings; and that the rules relating to the conduct of the Trustees meetings and of the sectional committee meetings be altered so as to attain this objective, in accordance with a notice of motion as approved or amended by the Trustees to be submitted to them at the next meeting.

By order of the Trustees and with the approval of the Governor-in-Council on 19 October 1942, the three sectional committees were abolished and the business which had been transacted by them was henceforth dealt with by the Board of Trustees. The special committees[8] were not affected by this change and they continued to exist and to operate as heretofore.

The concept of section committees was a sound one. But the effectiveness of a good organisation depends to a large extent on the calibre of the men who direct and control it from time to time. In the case of the Section Committee of the Industrial and Technological Museum it had rarely had chairmen with drive, vision, administrative creativeness, and an ability to overcome obstacles. Its abolition at this time was not therefore a retrogressive step.

The war moved the Board of Trustees to think, too, about the Institute's post-war development. In this connection, at the Trustees' meeting on 5 March 1942, Sir David Rivett put the following motion which was carried:

> In view of the following facts, namely:
>
> (i) that difficulties are steadily increasing in accommodating our four institutions satisfactorily in the present building;

[8] These were the: Books Committee, Building Committee, Felton Purchase Committee, Lectures Committee, National Museum Special Committee, Industrlel and Technological Museum Special Committee, National Gallery Committee and the Staff Committee.

(ii) that in particular there is a growing discrepancy between capacity to add to our art treasures (due to the Felton Bequest) and capacity to house them adequately;
(iii) that the present policy of makeshift by minor alterations and modifications here and there is not in the best interests of any of the institutions and is probably financially inadvisable;
(iv) that when the post-war reconstruction period arrives it is likely that a great programme of public works will be an essential measure in the handling of the immediate social problems of that time;

the Trustees record their views that:

(v) the time has come to adopt a policy aiming at handing over the whole of the present building and such additions as may be made on the La Trobe Street frontage and elsewhere to the National Art Gallery (including the Drawing and Painting schools) and to the Public Library;
(vi) that the Commonwealth and State Governments should be urged to place in high priority in the programme of post-war public works in Victoria, the erection, on some suitable site, of a building to house the National and Technological Museums collections;
(vii) that in due course a small committee of Trustees be appointed to advise on measures designed to secure these objectives.

The task was handed over to a Special Committee on Post-war Development. It met on 10 June 1942 under the chairmanship of the President of the Board of Trustees, Sir Keith Murdoch; its membership included Sir David Rivett. The business of this meeting was to consider his motion which had been carried at the Trustees' monthly meeting three months earlier.

After discussion, it was decided that Mr P. E. Everett, the Government Architect, Mr Leighton Irwin, and Mr J. F. D. Scarborough be invited to confer with the heads of the four branches of the Institution and then to report on the following principles, which the Special Committee had adopted, and on the problems which their adoption had raised:

* The Trustees feel that it is essential to prepare a long-range plan designed to cope with the developments over the next 50 years of all the institutions at present housed upon the site.
* During the next 50 years it is certain that the development of these institutions will be such that it can be said now that the continuance of them all upon the present site is impossible.
* It is probably necessary that the Public Library should remain on the present site. What must be done to it in order to make it quite first-rate by the most exacting modern standards?
* It is desirable that the National Gallery (including the Art Museum) should remain in close association with the Library. Can plans for reconstruction be devised which will make it quite first-rate by the most exacting modern standards?
* If so, will there as a result of such reconstruction be sufficient room left on the present site for either the National Museum or the Industrial and Technological Museum?
* If, as seems probable to the Trustees, there will be no room for either of these latter institutions, what suggestions can be made for their removal to an appropriate site or sites?

The final report of the Special Committee on Post-war Development was adopted by the Board of Trustees at its meeting on 28 October 1943. The report pointed out plainly what was already abundantly clear—that the four branches of the Institution could not continue to operate side by side in the same building and on the same site.[9] The Special Committee's main recommendations were:

(a) That a new site be acquired for the National Museum of Victoria.
(b) That when the National Museum of Victoria vacated the building it then occupied this building be then re-occupied by the Industrial and Technological Museum.
(c) That the National Gallery of Victoria, including its Schools of Painting and Drawing, be moved to another site, preferable one in Wirth's Park at the south-western approach to Prince's Bridge.
(d) That the Public Library be re-built, on its present site, to suit modern conditions.

The recommendations were embodied in a plan of reconstruction which was formally adopted by the Board of Trustees at this meeting. But the President of the Trustees did not let the matter rest at this point. Early in the following year, on Monday morning, 14 February 1944, he led a deputation from the Board of Trustees which called on the Premier, the Hon. A. A. Dunstan. The deputation's purpose was to outline to the Premier the Trustees' plans for post-war development and to request the government to make the required funds available to implement these plans.

Sir Keith Murdoch began by pointing out to the Premier that the Trustees had a dual role. They were the administrators of the Institution and they were the government's advisers on all matters concerning it. He then informed the Premier that the members of the deputation he led that day had called on the Premier in the role of government advisers; they had come to put to him specific recommendations and plans for their execution.

Sir Keith Murdoch explained to the Premier that in certain respects the Board of Trustees had worked under mounting difficulties. The building, in which the Industrial and Technological Museum and the three other branches of the Institution were housed, belonged architecturally to a vanished age. The building had been designed more than seventy years earlier; in some instances the original plans for it had not been completed, and for many years little had been done to bring about completion. When the war crisis had passed the Trustees felt that they should look forward to the coming post-war period and plan their part in that period of re-construction. Therefore, they had sought the best advisers available and they found them in three Fellows of the Royal Australian Institute of Architects whom they appointed to form a Special Committee. They were, the Premier was informed, Mr Percy Everett who was the Government Architect of Victoria: Mr Leighton Irwin who had given a lot of time, including one year's travel, to the study of hospitals, libraries and museums;

[9] The site has an area of 4¾ acres and it has long been "reserved for public purposes". Its four sides are bounded by Swanston Street on the west, La Trobe Street on the north, Russell Street on the east and on the south by Little Lonsdale Street.

and Mr J. F. D. Scarborough who was the President of the Royal Australian Institute of Architects. The Board of Trustees had asked them to advise what was needed in the way of buildings to bring the Institution's four branches up to the best architectural standards, then current, and to provide for estimated needs for the next fifty years. These architects had given a full year to the task; they examined in particular all buildings currently in use by the Institution; and they consulted members of the staffs who worked in these buildings. Their recommendations bore directly on the futures of the Industrial and Technological Museum and the National Museum. They said in effect that the Industrial and Technological Museum should be developed on its existing site because it needed to be in close proximity to the Public Library and to the Royal Melbourne Institute of Technology; that it needed more space to display current exhibits and its historical collections; that it needed more models to illustrate current industrial processes and technological developments; and that for the Museum to attain these ends it would be necessary to give the National Museum a new building on a new site.

Sir Keith Murdoch pointed out to the Premier that the Committee's recommendations were believed by the Board of Trustees to be not only proper but unavoidable and their execution to be pressing. The heads of the Institution's four branches also agreed with these recommendations as did the Art Galleries and Museums Association of Australia.[10] The necessity for these changes was indeed obvious to the most casual observer; they were necessary for the proper functioning of these individual organisations in the community and in order to render prompt and efficient service to the people of Victoria.

Another informed speaker, and one who had often spoken up publicly and critically in the past in order to promote the interests of the Industrial and Technological Museum was Sir David Rivett. He was reported[11] to have said that he did not like the name "Museum" for either the Industrial and Technological Museum or the National Museum; and that he would prefer to call the Industrial and Technological Museum the "Industrial Gallery of Victoria". He went on to say that the wonderful collections of machine tools, gathered together in the factories of Victoria for war purposes, should be available to be drawn upon for display in the Industrial and Technological Museum as exhibits in current use; Victoria's great brown coal resources for power and also its great primary industries should make it a strong State in so far as primary and secondary industries were concerned. The war had also developed Sir David continued, a "machine tool consciousness" in the public and this had placed new demands on the Industrial and Technological Museum. This Museum should be able to let the public see and understand these tools and the processes in which they have been used to build up Victoria's industrial strength. He emphasised that in a modern industrial and technological museum these machines could be shown in operation; but in Victoria's Industrial and Technological Museum there was no room to "swing a cat, let alone to work big industrial machines" for purposes of

[10] Annual Report of the Trustees, 1945, p. 48.
[11] *The Age* 15 Feb. 1944, p. 2.

training and education; "the quarters were entirely unsuitable as well as far too cramped".

In his reply to the deputation from the Board of Trustees that day, the Premier, Mr Dunstan, said: "So far as the general principles of the case you have presented go I am in entire agreement; and I can assure you that the Government is prepared to help you to obtain suitable and satisfactory premises".

More than a quarter of a century has passed since the then Premier uttered these words and during that time only one of the Institution's four branches—the National Gallery of Victoria—has been moved to a new building on a new site in another part of the city.

Nevertheless, towards the end of 1944, action was initiated to bring about some improvement in the organisation of the Industrial and Technological Museum's system of administration at the Trustees' level. In the previous year, at a meeting of the Board of Trustees on 28 October 1943, the following minute was recorded:

> The Chief Secretary asked for the views of the Trustees regarding changes in the constitution of the Board.
>
> To be informed that if the Government decides to proceed with the Trustees' post war recommendations and establish new buildings and separate institutions as therein suggested, the Trustees would consider that separate managements and trusts should be established in each of the four branches of the present institution.

Almost a year later, on 26 September 1944, Sir Frank Clarke took up this matter in the Legislative Council when he criticised, caustically, the system for the selection and appointment of Trustees for the administration of the Institution's four branches, one of which was of course the Industrial and Technological Museum. He regarded it as hardly satisfactory that this board should be expected to deal with matters which concerned those four branches. To illustrate his argument he pointed out that: "Six of the members may be first class authorities on books and the management of libraries, but they may know nothing about stuffed animals or the quality of paintings. Likewise, there may be some members who regard it as a special duty to look after the interest of the many employees, but who do not necessarily know much about books". Sir Frank Clarke then suggested that: "The general body of trustees should be split into at least three different committees and asked to attend to the special side of the institution on which they regard themselves as adepts". Sir Frank had strong views about the qualifications of trustees and about people who submitted their claims for appointment to the Board of Trustees. He informed members of the House on this occasion that:

> Whenever a new Government comes into power, I have noticed there has been an immediate rush of persons to be appointed to this Board of Trustees. The most extraordinary people make these efforts, and they know nothing about books, paintings, or museums. Apparently, it is a sort of honour, and it is almost equivalent to a university degree to some mentalities to be director[12] (sic) of the public library or the museum.

[12] Here Sir Frank Clarke obviously meant trustees.

> After having attended two or three meetings some of them found that they are not interested in these subjects, but they retain their positions for life and keep good men off the Board. More care should be taken in selecting members of the community who really have knowledge and experience of these matters.[13]

Two months later, on 30 November 1944, the Chief Secretary, the Hon. H. J. T. Hyland, M.L.A., introduced the Public Library, National Gallery and Museums Bill 1944 into the Legislative Assembly. It did not comply wholly with the Trustees' recommendation of October 1943 regarding "separate managements" for each of the Institution's four branches, but its object was to come closer to this ideal. The Chief Secretary explained that the purpose of the Bill was "to improve the system of government and control of the four institutions" and he pointed out that:[14]

> The weakness of the existing system lies in the fact that the four branches of the institution are not closely related to one another nor have they many interests in common, yet they are placed under one board of trustees, this arrangement being due, I feel, mainly to the fact that they are located in one building.

The Chief Secretary went on to say with truth that:

> The existing law provides for the appointment of not less than fifteen nor more than eighteen trustees, but there is no requirement that they shall have any particular qualifications or be representative of any particular art or science. It is possible under the law that the whole eighteen members may be experts in literature but know nothing about art, natural history, or applied science. It is equally possible to have eighteen art experts knowing nothing about literature or having no knowledge whatsoever of the work of the natural history or technological museums. The result is, naturally, that the interests embraced in the Institution are not always properly represented.

In the debate on this Bill on 6 December 1944, Mr William Slater, who was also a member of the then Board of Trustees of the Institution, drew attention to a letter published in *The Age* the previous day and signed by Mr E. R. Pitt[15] who had formerly been the Chief Librarian of the Public Library of Victoria and, in that position had been *ex officio* Secretary to the Board of Trustees. Mr Pitt therefore had good qualifications for writing on the difficulties and disadvantages of associating two Museums with dissimilar functions:

> Sir,
>
> SEPARATE TRUSTS FOR THE MUSEUMS
>
> The new Public Library, National Gallery and Museums Bill will go far to remove the present anomaly by which four institutions differing widely in functions are governed by the one body of trustees. With the decision to appoint separate bodies of trustees for the Library and the Gallery there will be little, if any, disagreement.

[13] *V.P.D.* vol. 217, 26 Sept. 1944, p. 1131.

[14] *V.P.D.* vol. 218, 30 Nov. 1944, pp. 2575 ff.

[15] Ernest Roland Pitt B.A.(Melb.), F.L.A. Officer of the Public Service of Victoria. Born 16 Oct. 1877 at Strathloddon, Victoria. Chief Librarian of the Public Library of Victoria from 27 Oct. 1931 to 16 Dec. 1943. Secretary to the Board of Trustees of the Public Library, Museums and National Gallery of Victoria from 27 Oct. 1931 to 16 Dec. 1943. Died 28 June 1957.

It is regrettable, however, that the Bill retains the present relationship between the National Museum and the Industrial and Technological Museum which are to be governed by the one body of trustees. These bodies have much less in common than the Library has with the Gallery. The National Museum corresponds with the British Museum (Natural History) in London and the Field Museum of Natural History in Chicago. The collections in these Museums and in the National Museum of Victoria comprise zoology, geology, palaeontology and anthropology. In addition, the British Museum includes botany. On the other hand the Science Museum at South Kensington, and the Armour Institute of Technology in Chicago includes engineering and similar exhibits which correspond with the bulk of our Industrial and Technological Museum collections. Neither type of institution trenches on the others field.

The real anomalies in the present Victorian situation are that (i) botany is not included in the National Museum functions, but has been dealt with hitherto by the National Herbarium, (ii) the Industrial and Technological Museum houses a valuable collection dealing with economic botany, economic agriculture, and plant pathology, (iii) the Geological Museum of the Mines Department performs functions which, if not identical with, are similar to, those of the geological section of the National Museum. There is consequent overlapping.[16]

The difficulties will be accentuated when the National Museum is moved to its new site[17] and one body of trustees, representing two dissimilar interests, is given control of two institutions housed on different sites. Separate bodies should be immediately instituted, each working out its own post-war scheme, and empowered to suggest to the Government amalgamation of cognate functions to prevent the undue overlapping which now confuses students in search of material to pursue their researches. Other debatable points in the new Bill are the omission to make the new institutions corporate bodies, the varying quorums within each body, and the ability of any trustee to attend four monthly meetings only each year without notification being made to the Chief Secretary for his information in connection with renewals of appointments. The all-important modification, however, is the separation of the constitutions and functions of the two dissimilar museums.

Flinders Lane.

Yours, etc.
ERNEST R. PITT

The Bill was assented to on 11 December 1944. In accordance with this new Act's[18] provisions, the Board of Trustees of the Public Library, the National Museum of Victoria, the Industrial and Technological Museum of Victoria, and the National Gallery of Victoria was dissolved and each trustee vacated his office. The Act also provided, by way of replacement, for the creation of three separate and independent boards of trustees. One board was to administer the Public Library of Victoria, another the National Gallery of Victoria, and a third was to administer the two Museums[19]—

[16] This paragraph was part of the original letter; but it was deleted from the text published in *The Age*, 5 Dec. 1944, p. 2. See *V.P.D.*, vol. 218, 6 Dec. 1944, p. 2767.

[17] Twenty-six years later, in 1970, the National Museum of Victoria was occupying the same part of the Public Library building as it did in 1944.

[18] Public Library, National Gallery and Museums Act 1944. (Act No. 5053).

[19] The Board of Trustees to administer the two national museums consisted of not less than eight and not more than ten persons. Each trustee was to hold office for the term (not exceeding seven years) for which he was appointed; and any trustee could be removed by the Governor-in-Council.

the National Museum of Victoria and the Industrial and Technological Museum. The Act also changed the designation of the Industrial and Technological Museum to that of "Museum of Applied Science", and was to come into force on a date to be proclaimed.

The Chief Secretary announced publicly, on 5 March 1945, the names of the persons to be appointed to the three new boards of trustees.[20] Then at a meeting of the Executive Council on 13 March 1945 the following persons were officially appointed to the Board of Trustees which would administer the two museums—the Museum of Applied Science and the National Museum.

Mr William Rupert Dean, A.R.C.A.
Mr Wilfrid Russell Grimwade, C.B.E., B.Sc.
Mr Laurence John Hartnett, C.B.E., M.I.E.
Brigadier Errol Galbraith Knox, M.B.E.
Mr Daniel McVey, A.M.I.E.
Mr Stanley Robert Mitchell, M.A.I.M.M., A.A.C.I.
Mr Philip Crosbie Morrison, M.Sc.
Sir Albert Cherbury David Rivett, K.C.M.G., M.A., D.Sc., F.R.S.
Colonel Fred Garner Thorpe, M.C., E.D.

These Trustees were appointed for a term of five years from 16 March 1945, which was the date for the new Act coming into force.[21]

At this stage, the war was in what proved to be its final year and this re-organisation of the system of trustee administration placed the Museum of Applied Science in a more effective position than hitherto to confront the problems of the coming post-war era.

[20] *The Age*, 6 March 1945, p. 3.
[21] *V.G.G.*, No. 33, 14 Mar., 1945, p. 872.

Chapter 9

A New Deal (1945-50)

In retrospect the five-year period following the war of 1939-45 is seen to have been a highly significant one for on it much of the Museum's later development was based. The dominating factor in this new era was of course the splitting up of the old single trust—so heavily pre-occupied with art and library issues. Although the new body of trustees of the National Museums was responsible for directing and controlling both the National Museum of Victoria and the Museum of Applied Science, this new arrangement was a tremendous improvement on the organisation and system of administration which had hitherto existed for three quarters of a century. There were men among these new trustees with deep and genuine interests in applied science —Russell Grimwade, Laurence Hartnett, Daniel McVey, and Fred G. Thorpe in particular.

It is not surprising then that this immediate post-war period was a creative one. It was productive for three different reasons. First, because of the leadership which the Trustees gave to the Director and his small staff; second, because of the plans which originated at the Trustee level, and third, because of the support which the Trustees gave to any worthwhile recommendations which the Director submitted to them.

The first meeting of the Trustees of the National Museums, on Tuesday, 27 March 1945, was held in the office of the Director of the National Museum of Victoria. The Trustees present were:[1] Mr W. R. Dean, Mr W. R. Grimwade, Brigadier E. G. Knox, Mr Daniel McVey, Mr S. R. Mitchell, Mr Crosbie Morrison and Sir David Rivett.[2]

The Trustees met in an atmosphere of optimism. The end of the war was in sight although it could not then be foreseen that it would actually end only two months later, in May 1945, in Europe and five months later, in August 1945, in the Pacific. The organisation and functions of the new Board of Trustees also gave rise to optimism when compared with those of the Board of Trustees it had replaced. The functions of the new Board were more limited and the responsibilities of the Trustees were restricted to two institutions instead of, as formerly, to four. Other advantages were the considerable reduction in the number of trustees and the change in the terms of their appointments which were for a prescribed number of years and not, as formerly,

[1] The Directors of the two Museums also attended this meeting.
[2] Apologies were received that evening for non-attendance from Messrs Hartnett and Thorpe.

for life. All these factors tended to heighten expectations that business would be transacted in future with greater rapidity and with increased efficiency and that persons would be attracted to the Board of Trustees with special interests in one or other of the two museums—interests which were based on scientific and technical training and wide practical experience at higher management levels. Trustees of this calibre, with genuine scientific interests, had not always been appointed in the past.

The first business that evening was to elect the following office bearers: Chairman, Mr W. R. Grimwade;[3] Deputy Chairman, Mr P. C. Morrison; and Treasurer, Mr S. R. Mitchell.

The new Trustees in the year 1945 looked back over a war-time period when the fortunes of what had become the Museum of Applied Science were at a low ebb. The war had deprived the Director of the help of his only professional assistant and the Museum's income was utterly inadequate for its needs. To make matters worse the reconstruction of the main foyer, which had been commenced soon after the outbreak of war in 1939, had dragged on interminably because of the ever growing shortages in labour and materials. The main gallery in the Queen's Hall, located above the foyer, was affected by this reconstruction. The central section of its floor had been removed and the whole area had to be closed off from the public. These two major alterations were still unfinished at the end of the war.

Because of these obstacles to normal work the Director, Mr. E. H. Penrose, had devoted much time to the preparation of a catalogue of firearms. But when the professional assistant,[4] Mr R. H. Fowler, returned to duty in July 1945, it became possible to concentrate on the Museum's post-war problems. The Director and Mr Fowler spent much time in planning for staff expansion and working out new approaches to display and the provision of better services. The Director's reports and recommendations were almost invariably supported by the Trustees and resulted in the first real staff build-up in the present century.

A special matter in which the Museum became interested, early in 1945, was the Victorian Government Observatory in the Domain which was to be closed later that year. In a letter to the Museum, dated 27 March 1945, Mr John D. Keating of North Fitzroy[5] suggested that it undertake an observatory service. The details of his suggestion were taken up by the Trustees with enthusiasm and developed with a success which has continued to the present time.

When the Victorian Government Observatory ceased its activities as such on 7 October 1945 and its equipment was distributed, certain items were allotted to the Museum. These included the 8-inch refractor telescope and in addition the Trustees

[3] Sir Wilfrid Russell Grimwade, C.B.E., B.Sc.(Melb.), F.C.S., F.A.C.I. Company director. Born 15 Oct. 1879. Chairman of the Board of Trustees of the National Museums of Victoria from 16 March 1945 to 15 March 1950. Died 2 Nov. 1955.

[4] In February 1946 the position of "Assistant", occupied by Mr Fowler, was re-classified and re-designated "Senior Assistant".

[5] Mr John Deakin Keating, B.Com.(Melb.). Now a retired officer of the Public Service of Victoria. Born 10 March 1908. Sometime Chief Probation and Parole Officer of Victoria. Author of *Mind the Curve*, an historical account of cable tramways.

secured a permissive occupancy of the actual site and premises of the Observatory. As a result of later negotiations between the Astronomical Society of Victoria and the Museum of Applied Science a scheme was evolved for conducting public demonstrations with the telescope on its original site.[6]

The scheme was inaugurated in May 1947. It was administered by the Museum of Applied Science[7] with the aid of a staff of honorary demonstrators in astronomy who were trained and selected by the Astronomical Society of Victoria from its members. The first honorary demonstrators were selected by Messrs W. L. Clapham and G. H. Woodhouse and the work of these original honorary demonstrators is carried on today by their successors.

When entering this "new deal" era it was hoped that the Museum of Applied Science would have more money than hitherto to spend on general development and on its collections, for it was neither possible nor desirable to depend solely on donations as a means of enlarging collections. The following table indicates that these hopes were soon realised:

ESTIMATES OF THE MUSEUM OF APPLIED SCIENCE OF VICTORIA
(Exclusive of Salaries, Works and Buildings)

Financial Year	Estimates* Approved	Financial Year	Estimates* Approved
1944-45	£500	1947-48	£950
1945-46	£500	1948-49	£2000
1946-47	£800	1949-50	£2100

* These figures were extracted from Annual Reports of the Trustees.

One of the Museum's original major collections was that of firearms and, with frequent additions, it has maintained its attraction for visitors since it was first displayed a hundred years ago. At a meeting of the Board of Trustees in March 1947 the Director, Mr Penrose, formally asked for permission to publish his catalogue of this collection. It was decided at a later meeting of the Board, in May 1947, that Mr Penrose's manuscript would be published by the Trustees in book form, that two thousand copies were to be printed at a cost of 4*s.* 10*d.* per copy, and that the retail price would be 10*s.* 6*d.* per copy.

The book, entitled *Descriptive Catalogue of the Collection of Firearms in the Museum of Applied Science of Victoria*, was reviewed in *The Age* in July 1949.[8] The reviewer believed that Mr Penrose had possibly erred in describing the work as a catalogue which was, he said, "surely a little frightening and austere". He pointed out too that:

[6] *Yearbook of the National Museums of Victoria*, 1948, p. 26.

[7] In 1970 the Observatory Council of Victoria administered the Observatory on behalf of the Institute of Applied Science. Of the Council's nine members, five are nominated by the Astronomical Society of Victoria and two by the Institute of Applied Science. The Chairman and the Deputy Chairman of the Council are those persons who are currently the Chairman and the Director of the Institute of Applied Science.

[8] *The Age*, 16 July 1949, p. 6. See also *The Herald*, 9 July 1949, p. 14.

"this catalogue merits the title of book, a book that this reviewer found to be vastly more entertaining than many best-selling novels". Indeed, Mr Penrose's book proved to be a best-seller, with a world-wide demand. Although it has been out of print for over ten years there is still a demand for it and it is eagerly sought after on the second-hand book market at prices considerably in excess of its original retail price.[9]

The new Board of Trustees was quick to realise that if the Museum were to be revitalised, so that its work could be done quickly, correctly and smoothly and without undue delays and unnecessary waste of time, it would have to do this through its staff. It therefore gave some attention to the staff in general and to its numbers and its salaries in particular.

A new office of Physicist was created because of the phenomenal developments in electronics and allied subjects during the late war. But there was a severe shortage of physicists at that time and it was not until June 1947 that it was filled. Meanwhile, the Senior Assistant, Mr Fowler, was able to concentrate on applied biology and on such tasks as developing new techniques in precision modelling of reference specimens of fruit and vegetable varieties, fungal and insect pests of plants and their control, veterinary pathology and numerous other biological subjects. A section on bacteriology was created, this subject being one usually overlooked by both science and natural history museums. The modelling work grew to important dimensions and the Museum supplied copies of models to the Department of Agriculture and to other interested organisations. These models became of great value for out-of-season instruction and for general reference purposes and enquiry services.[10] During this same period the machine shop facilities were greatly expanded by the purchase of a second and larger lathe, a milling machine, a metal-folding machine, a guillotine, a spot welder, a flame welder, and a comprehensive stock of smaller precision tools.

In the two immediate post-war financial years the staff of the Museum increased from three officers—the Director, the Senior Assistant and the Museum Technician—in 1945-46 to six officers in 1946-47[11], as shown hereunder:

STAFF LIST OF THE MUSEUM OF APPLIED SCIENCE*
(As at the 1 July 1947)

Appointment	Occupant	Date of appointment
Director	E. H. Penrose, C.E.	11 February 1936
Senior Assistant	R. H. Fowler, M.Agr.Sc.	23 May 1936
Physicist	J. C. Liddy, B.Sc.[12]	12 June 1947
Assistant	N. W. Lewis	16 September 1946
Museum Technician	S. A. Pick[13]	24 October 1938
Clerk	R. T. Barr	26 May 1947

* Exclusive of attendants, carpenters, and labourers who were carried on the establishment of the Central Administration.

[9] A file has recently been opened in expectation of the publication of a new and revised edition of this book. Because of a substantial growth in the arms collection since this book was first published this new edition, if and when published, should again become a "best seller".

Mr Norman W. Lewis was the first post-war officer appointed to the staff of the Museum. He carried on and expanded the photographic section and he assisted in the work of biological modelling. Both these activities had been commenced before the war of 1939-45 by Mr Fowler. Relief from the burdens of routine clerical work came too with the appointment of Mr F. D. O'Donnell as a junior administrative officer. But he did not stay long and on 26 May 1947 he was succeeded by Mr R. T. Barr, who remained in the position until October 1949. Mr Barr had personal qualities and experience (in the hardware trade) which fitted him admirably for the office duties of the Museum. His departure from the Museum followed representations by the Secretary of the Central Administration of the Public Library, National Gallery and Museums to the Permanent Head of the Chief Secretary's Department for his transfer to the Central Administration staff. This transfer was resisted, but to no avail, by the Director of the Museum of Applied Science.

Mr Liddy commenced duty in the position of Physicist at the Museum on 17 June 1947;[14] the first occupant of the position, he had come from a career in private industry where he had gained wide experience in electronic engineering. His work at the Museum has since resulted in an increase in modern exhibits which illustrate the scientific principles involved in such things as radio, radar and television communications, X-ray photography, induction heating, the uses of atomic energy and developments in electrical engineering. Since his appointment he has also contributed papers to professional journals and to the *Victorian Year Book*; and he has done much, by means of lectures, to make the work of the Museum better known to the public.

A sub-committee of the Board of Trustees met on the 17 November 1947 to consider the decisions which the Public Service Board of Victoria had recently made on the classifications and salaries of the staffs of the two Museums.

The sub-committee regarded the Public Service Board's decision with disappointment; it said that the classifications and salaries approved for the Museums' staffs in the professional, technical and general divisions were considerably below the standards which it regarded as appropriate to the training and skill of the staff in these divisions. It pointed out that the new classifications and salaries approved for the Directors of the "four institutions now occupying this building" were anomalous. The Director of the National Gallery of Victoria was placed in a salary range of £950-£1100; the

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[10] Miss Sydney Joy Dickins, a Diplomate in Art of the Swinburne Technical College at Hawthorn, was appointed to the staff to expand this work and a new and larger preparation laboratory was constructed and fitted out. Miss Dickins commenced duty on 30 May 1949. She resigned as a Permanent Public Servant on 28 July 1952 to be married. But as Mrs Stewart she continued in the appointment as a temporary officer, until 8 Dec. 1952. See Annual Reports of the Trustees for 1948-49, p. 1 and 1952-53, p. 3.

[11] Published in the *Year Book of the National Museums of Victoria*, 1948, p. 1.

[12] Mr John Charles Liddy, B.Sc.(Melb.), Permanent officer of the Public Service of Victoria since 12 June 1947.

[13] Mr Stanley Alan Pick. Permanent officer of the Public Service of Victoria. Museum Technician of the Institute of Applied Science from 24 Oct 1938 to 26 March 1966. Retired from the Public Service of Victoria on 26 March 1966.

[14] Annual Report of the Trustees, 1946-47, p. 1.

Chief Librarian of the Public Library of Victoria was given a salary range of £850-£1000; the Director of the National Museum of Victoria was given a salary range of £748-£850; and the Director of the Museum of Applied Science was given the salary range of £670-£722. The sub-committee reported that: "We feel that these four positions are of parallel importance and responsibility and demand equivalent special skills". They also pointed out, what the Public Service Board had probably overlooked, that: "The lower grading of the Directors of the Museums has set too low a limit upon the salaries of the staffs under them". It recommended that further representations be made to the Public Service Board or to the Minister to increase the gradings and salaries of the staffs of the two Museums.

At the 38th meeting of the Board of Trustees of the National Museums on the 17 February 1949 it was reported by the Secretary that the Public Service Board of Victoria had approved of the classification of the Director of the Museum of Applied Science being raised from the range £670-£722 per annum to £748-£800 per annum.[15]

In the previous year the Director of the National Museum of Victoria, Mr R. T. M. Pescott had travelled overseas on a study tour. When he returned, his report on this tour was published.[16] This report is of administrative as well as of scientific interest because of certain recommendations he made in it. One was an important recommendation for a change in the organisation and functions of the Board of Trustees which at that time administered the two National Museums. He recommended "The separation of the present body of ten Trustees of the National Museums of Victoria, who are responsible for the conduct of both the National Museum and the Museum of Applied Science, into two separate and distinct Boards of Trustees, each responsible for one of the two Museums." In setting out his reasons for this recommendation he stressed that: "it is the unanimous experience of overseas institutions that where one body of Trustees is expected to administer two separate and totally distinct Institutions, the most efficient development of both Institutions does not take place."

At a special meeting of the Trustees of the National Museums, on Wednesday evening, 1 June 1949, under the chairmanship of Sir Russell Grimwade, it was decided to adopt Mr Pescott's recommendation and to recommend to the government:

> That the present body of ten trustees administering the affairs of the National Museum and the Museum of Applied Science be separated into two bodies of trustees, one for the Museum of Applied Science and one for the National Museum.

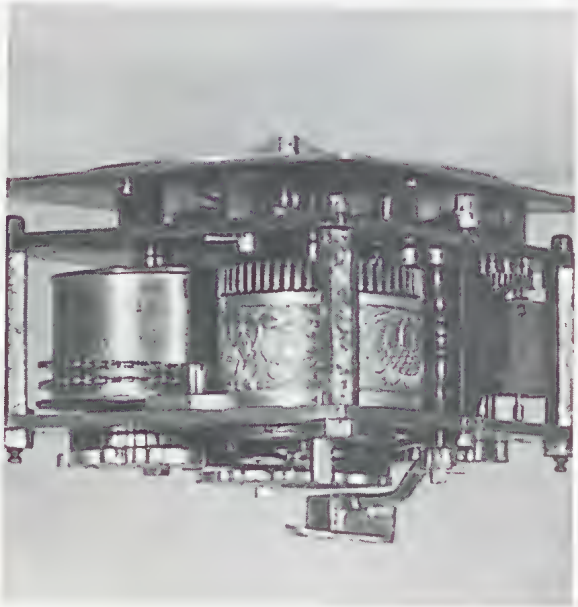
At the Trustees 44th meeting on the 27 October 1949, the Secretary reported that a Bill had been prepared to give effect to the Trustees' recommendation that the existing Board of Trustees be disbanded and that a new one be set up for each of the two Museums. From this time onwards events moved quickly and in the following month the Bill, entitled the Public Library, National Gallery and Museums Bill, was presented to Parliament.

[15] *V.G.G.* no. 79, dated 9 Feb. 1949, p. 978.

[16] *Report of the Director, National Museum of Victoria, on his Visit abroad during June to December 1948*. Published by the National Museum of Victoria, 1949.

PLATE 52. Richard Hindle Fowler. The Centenary Director.

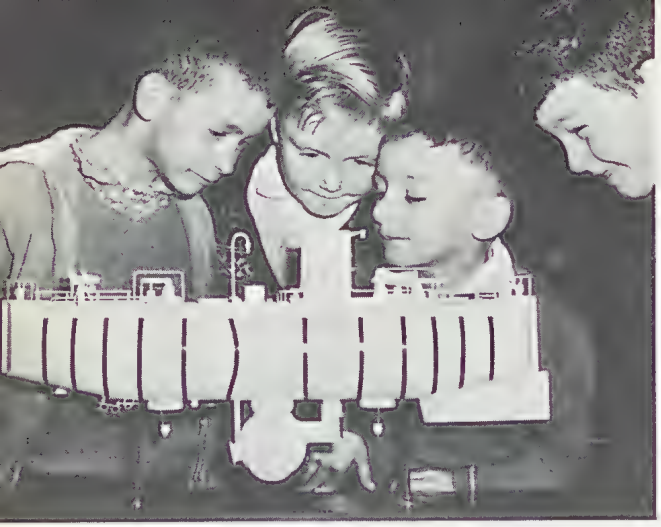
PLATE 53. The clipper *Thermopylae*. One of the world's most accurate ship models. Made by Cyril L. Hume of Sydney.

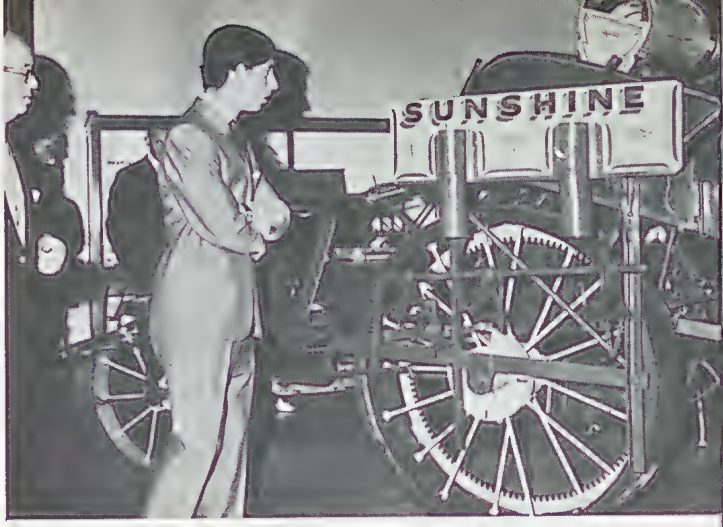


PLATES 54 & 55. A 17th century table clock, made by G. Schultz, Konigsberg.

PLATE 56. The transport exhibits in the Verdon Hall.

PLATE 57. Art students make use of Museum displays.





PLATES 58, 59, 60 & 61. Visitor involvement. Photograph of H.R.H. Prince Charles by courtesy The Herald and Weekly Times Ltd.

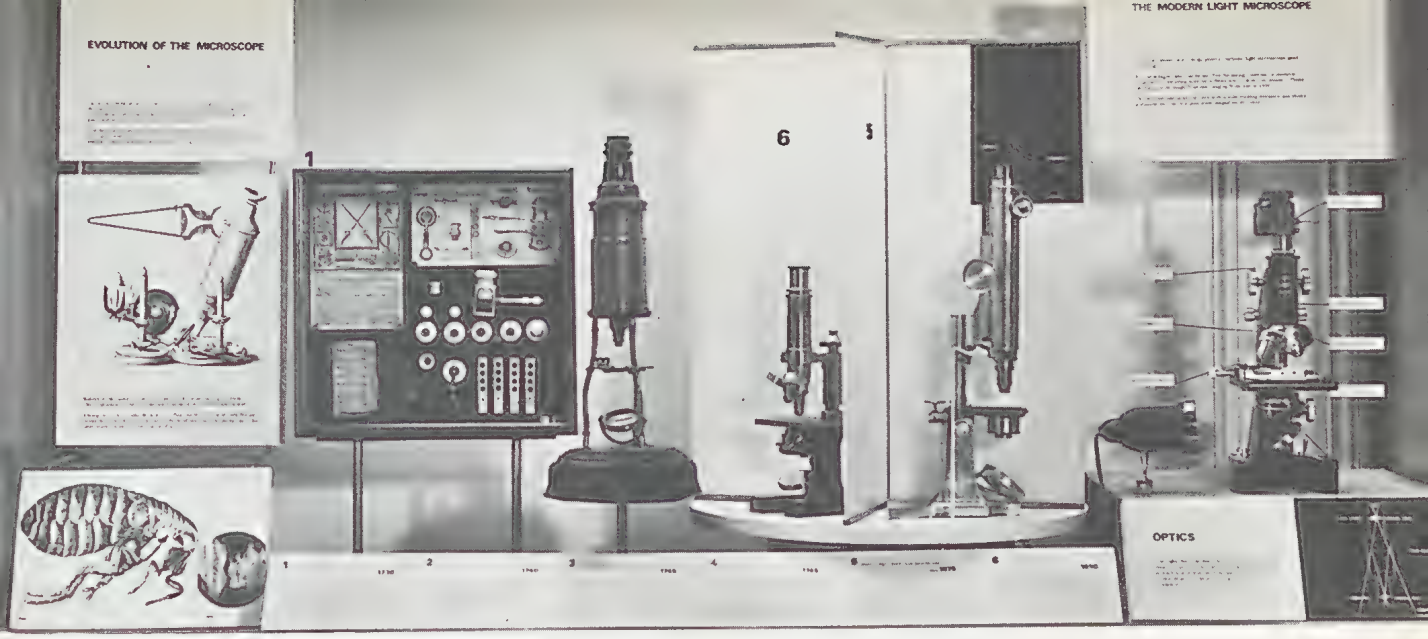


PLATE 62. A display covering the history of the microscope.

PLATE 63. Sir Arthur Rylah and Sir Laurence Hartnett at the opening of the exhibit on telephony, 8 July, 1959.

PLATE 63A. A view of one of the many school pupils' entries in the Science Teachers' Association's Annual Science Talent Search in August 1970. The Science Museum and the National Museum were joint hosts.

PLATE 64. Mr. A. R. Cavill, Planetarium Lecturer, explaining detail in the H. V. McKay Planetarium.

PLATE 65. Marcus (Andrew Hislop) Clarke, 1870-73.

PLATE 66. Eric Neil Dewar, 1945-59.

PLATE 67. William McCall, 1959-67.

PLATE 68. William Leslie Drew, 1967- .

Secretaries to the Trustees. The office of Secretary was combined with that of Accountant, 1873-86, and Chief Librarian, 1886-1945.

When the Chief Secretary, Lieutenant-Colonel Leggatt, moved in the Legislative Assembly on the 22 November 1949 that the Bill be read a second time he said:

> The Bill is a small one, the purpose of which is to readjust the trusts which were created by the Act of 1944. Members may recall that prior to that year there was one trust to govern four separate institutions, namely, the Public Library, the National Gallery, the National Museum, and the Museum of Applied Science. While these four entities were housed in the one building, each had its own interests, without any real bond of unity.

The Chief Secretary then informed the Assembly that:

> On the advice of overseas experts and the recommendation of the majority of the trustees themselves, the trust was divided, a separate trust being suggested for each institution. The Government of the day, however, for purposes best known to itself, united the National Museum, dealing principally in natural history, and the Museum of Applied Science, interested in entirely unrelated matters, and appointed the one trust to manage their affairs.

The Chief Secretary also explained that:

> Although the trustees have worked amicably together, they feel, and the Government agrees, that it would be to the advantage of each Museum, with widely diverse activities, if a separate trust were appointed to control its destiny. The man who is an expert in natural history may know little of technical or industrial scientific development, and the industrial scientist may have little interest in natural history. The present Board of Trustees is formed with representation of each section, but the personal interest of the individual trustees is necessarily limited either to one or the other of the institutions.[17]

From the Opposition benches Mr Frank Crean also spoke on the Bill. He spoke too on this occasion with the knowledge and authority of a Trustee of the Public Library of Victoria since March 1946. He said in one part of his speech that:

> Recently I asked Mr Pescott how the Museum of Applied Science and the National Museum were divided and he said that broadly the distinction was between natural science and physical sciences as embodied in the researches of physics and chemistry. However, where natural science has any economic impact it will be placed in the division of applied science. One example of the latter grouping is the fruit moth which, of course, has economic implications.[18]

But what the government urged Parliament to approve late in 1949 was the culmination of sporadic efforts which reached back into the past. Twelve years earlier the Director of the National Gallery of Victoria, Mr MacDonald,[19] had advocated the same kind of change as Mr Pescott had proposed later. He had informed the Chief Secretary, in a memorandum dated 21 June 1937, that:

[17] *V.P.D.*, vol. 231, Session 1949, 22 Nov., 1949, pp. 4193-4.
[18] *V.P.D.*, vol. 231, Session 1949, 24 Nov., 1949, p. 4448.
[19] James Stuart MacDonald. Artist, art critic and author. Born 28 March 1878. Director of the National Gallery of Victoria, 1937-42. Died 12 Nov. 1952.

> The National Gallery can never flourish under the present system of administration. This system provides for a board of eighteen trustees who have in their charge the Public Library, the Natural History and Technological Museums and the National Gallery. The General Secretary to all four institutions is the Chief Librarian.
>
> As Secretary to the Trustees he has great power and equitable as he may strive to be he unconsciously, but quite naturally, favours his own institution. He is privy to the affairs of all the institutions—the one of which he is the chief and the three of which he is not.

These remarks on the disadvantageous position of the National Gallery were equally applicable, at the time they were written, to the Industrial and Technological Museum. But with the passing of the Bill before Parliament late in 1949, the last vestiges of the system which Mr MacDonald had complained about in 1937, and which had survived the statutory re-organisation of 1945[20], were swept away. The Museum of Applied Science was to be given the kind of board of trustees which Mr MacDonald had advocated for the National Gallery of Victoria when he wrote in his already quoted memorandum of the 21 June 1937 to the Chief Secretary:

> What then is needed is a board for the National Gallery quite separated from the other institutions. It should be a small board similar to that of the Canadian National Gallery which is the best gallery in the Empire outside of Great Britain. It consists of five members. These should be appointed for not less than five and not more than seven years, at the end of whichever term is decided on the retiring trustee or trustees stepping down for at least one year, but being eligible, when the next vacancy occurs, for re-appointment.

The Bill was assented to in December 1949[21] and it came into force in March 1950. In so far as the Museum of Applied Science was concerned this new Act gave it, at the trustees' level, a more effective organisation and a better system of administration than it had hitherto enjoyed. And so passed away at last those administrative difficulties, sources of friction and causes of inefficiency which had often been complained about in the past by those who had to discharge their duties within the framework of an administrative machine which was unsuitable organisationally rather than one which had become outmoded.

The immediate effect of the new Act was to dissolve the Board of Trustees which had administered the two national museums since 1945 and to retire the Trustees. Despite the short period of this board's existence—it extended from its first meeting on 27 March 1945 to its forty-sixth on 16 February 1950—its achievements were considerable. One obvious explanation for this success, under the chairmanship of its only president, Sir Russell Grimwade, was that the Board of Trustees was able to devote its time and attention to a narrower field of functions than those of the one preceding Board. One of the highlights of the Grimwade board's short existence was to see the government of Victoria, in May 1948, reserve "as a site for the purposes

[20] See pp. 99-102 above.

[21] Act No. 5447—*Public Library, National Gallery and Museums Act 1949*. It was assented to on 6 Dec. 1949 and it came into force on 16 March 1950.

of the National Museum of Victoria" the area in the Domain in Melbourne which the Observatory had formerly occupied.[22] This reservation should bring benefits, in due course, to the Museum of Applied Science. Another achievement of this short-lived Board of Trustees lay in the field of finance. It managed to have the Estimates of the Museum of Applied Science increased sharply from £500 in 1945-46 to £2,100 in 1949-50.[23]

[22] R. T. M. Pescott, *Collections of a Century*, pp. 157-8.
[23] These were for general expenditure and were exclusive of salaries.

Chapter 10

A Better Deal (1950-60)

One of the most momentous events in the history of the Museum of Applied Science occurred on 10 March 1950 when the Chief Secretary, Lieutenant-Colonel Leggatt, announced the names of the persons who had been nominated for appointment to the Museum's new Board of Trustees.[1] The Museum was about to gain an administrative independence which it had not previously enjoyed. After an existence of eighty years—a period characterised at times by administrative neglect and indifference and sometimes by regression as well as growth—the Museum was about to be given, as a statutory right, a board of trustees with no official responsibilities other than the maintenance and development of the Museum.

In accordance with the provisions of the Public Library, National Gallery and Museums Act 1949,[2] the Governor-in-Council appointed the following five persons,[3] with effect on and from the 16 March 1950 to be Trustees of the Museum of Applied Science of Victoria:

Mr Walter Eric Bassett, M.C., M.Mech.E., B.E.E., M.I.E. Aust.*
Mr Laurence John Hartnett, C.B.E., M.I.E.Aust.†
Professor Ernst Johannes Hartung, D.Sc.*
Mr Oliver Emanuel Nilsson, B.Sc., A.M.I.E.Aust.†
Colonel Fred Garner Thorpe, M.C., E.D., M.I.Prod.E., A.M.I.E.Aust.§

* Appointed for 5 years.
† Appointed for 3 years.
§ Appointed for 7 years.

Three of these Trustees, Messrs Hartnett, Nilsson and Thorpe, had served on the previous National Museums board, in fact Hartnett and Thorpe were foundation members of it. This circumstance gave the new board a useful element of continuity, with the carried-over members at last free to inject the best of their special aspirations into the new body without the restrictions set by the old duality of function. At their

[1] *The Age*, 11 March 1950, p. 11.
[2] Act No. 5447.
[3] This Act empowered the Governor-in-Council to appoint not less than five and not more than seven persons to be Trustees of the Museum of Applied Science of Victoria.

first meeting, on Thursday afternoon 30 March 1950, in the Board Room of the Museum of Applied Science, the following office bearers were elected for the remainder of the financial year, ending on 30 June 1950.

Chairman	Colonel F. G. Thorpe.[4]
Deputy Chairman	Professor E. J. Hartung.[5]
Treasurer	Mr Walter Eric Bassett

Colonel Thorpe brought good personal assets to his position as the foundation chairman of the Trustees of the Museum of Applied Science. He was a man with wide technical experience in the profession of engineering; and with his technical experience he combined extensive top level managerial experience, as a company director, in the handling of men and material. In his approach to problems and people, Colonel Thorpe was essentially an engineer and a soldier. He had begun life humbly, and was educated at State School No. 1490 at North Fitzroy. Then he entered the service of the Department of Railways of Victoria as an apprentice fitter and turner at the Railway Workshops at Newport. Later he gained diplomas in mechanical and electrical engineering at the Working Men's College in Melbourne. He served in the War of 1914-18, as an engineer officer with the A.I.F., and was awarded a Military Cross. In the early stages of the War of 1939-45 he was the Chief Engineer of Southern Command in Victoria. But he vacated this appointment in 1940 to become Director of Machine Tools and Gauges in the Commonwealth Department of Supply and Development; and he held this appointment until the termination of hostilities in 1945.

This new board pushed on vigorously with the long neglected work, taken up by the previous board, of pressing for improvements in the working conditions of the staff. The improvements aimed at were better salaries, more staff, and staff with a wider variety of specialised training, skills and experience, and better physical conditions in which to work. Improvements of this kind, the Trustees believed, would be reflected in better service to the public.

Indeed science museums throughout the world were entering upon a new phase of development, and the Museum of Applied Science of Victoria was no exception to this trend. When the Museum was originally established in 1870 it had two main functions. The first was to give educational guidance of a technical character to artisans; and the second was to accumulate comprehensive records of technological achievements in the form of collections to exhibit. By 1950 the former function had long since been confidently passed to organised technical schools. But the latter function had already almost collapsed under its own weight.

[4] Later Colonel Sir Fred Garner Thorpe, M.C., E.D., M.I.Prod.E., A.M.I.E., engineer and company director. Born 25 Dec. 1893 at Marcorna, Victoria. Chairman of the Trustees of the Museum of Applied Science of Victoria from 16 March 1950 to 30 June 1954; and Chairman of the Institute of Applied Science of Victoria from 4 Nov. 1963 to 30 June 1965. Died 29 March 1970.

[5] Now Emeritus Professor Ernst Johannes Hartung, D.Sc. Professor of Chemistry in the University of Melbourne, 1928-54.

The world could look back in that year on a unique half-century of scientific achievement. It was a period which had culminated in museum directors and their staffs looking at their tasks in a new and different way. They were tending to concentrate their attention on the presentation not of an uncritical accumulation of scientific material but on selected facets. The object of this new method of presentation was to give the layman an understanding of science's impact on society. The approach to this new objective lay in the new ideas of display, in extending services to the public, and in maintaining a proper balance between the old and the new, between the historical and the current exhibits.

But it had to be recognised that the Museum of Applied Science had lagged behind in this scientific race because of deficiencies in space, accommodation and equipment and in staff. The new Board of Trustees indicated plainly by its actions that it intended to change this situation, that it intended to do what it could and without any undue delay to ensure that this "new deal" for the Museum became a reality. The business of its first meeting included the appointment of the Chairman, Colonel Thorpe and the Treasurer, Mr W. E. Bassett, to a joint committee of the Museum of Applied Science and the National Museum of Victoria to report on staffing and salaries of the two Museums. Then, following hard on the appointment of this committee, the Secretary to the Trustees was able to inform the Trustees, at their meeting on 16 October 1950, that the government had approved the Museum's Estimates for general expenses for 1950-51 amounting to £4,000. This was a considerable increase on the Estimates for the previous financial year which amounted to £2,100.

But all was not well. In the Museum of Applied Science's Annual Report for 1950-51 it was recorded that continued progress was threatened mainly by its urgent need of more space. It pointed out too that the Museum of Applied Science came last in the matter of floor space allocations between the four institutions in the building; and that the urgency of satisfying this need for more space overshadowed in urgency all other wants of the Museum.

As December 1950 approached, the Trustees had to look about for a suitable Director to succeed Mr Penrose who was about to vacate the position and retire on superannuation. During the past five years he had been directing and controlling a great deal of administrative activity. After the inception of the new Board of Trustees in March 1950 he had recommended the creation of three new positions to be filled by a Chemist, an Agricultural Scientist and an Assistant (Mechanic), and in response to a request from the Trustees he had prepared a comprehensive report entitled "Lines of Future Development".[6] This report dealt with the ultimate subject coverage of the Museum, and with the new approach to display presentation, which concentrated on public appeal and quality rather than on mere quantity being presented ineffectively. This report laid further stress on additional staffing needs, adding

[6] "The Lines of Future Development", drawn up by Mr E. H. Penrose, was a report on the policy for the development of the museum and it was adopted by the Trustees of the Museum on the 21 Aug. 1950. For its text see *Report by the Director, C. M. Focken, on Overseas Study Tour*: published by the Museum of Applied Science of Victoria, 1953.

the categories of engineer, metallurgist, biochemist, librarian and further technical assistants to the requisitions which had already been put forward. It also urged the provision of service to schools, universities and societies, expansion of publications, instituting competitions and the conducting of research integrated with the subjects dealt with in selected facets of the displays. The report was adopted in August 1950 and it became the official reference document for the future planning of the Museum, to be quoted frequently in many subsequent submissions to the government.[7]

The position of Director of the Museum of Applied Science of Victoria was advertised in Australia[8] and overseas by the Public Service Board of Victoria and applications were invited until the 6 January 1951. The salary range of the position was £1,181-£1,381; the duties were "to be responsible for the efficient management and progressive development of the museum"; and the qualifications were to possess a University Degree or Technical College Diploma (or the equivalent of either) in chemistry, engineering or science, to have had subsequent commercial and industrial experience, to be a capable administrator with proved organising ability, and preferably to be under 45 years of age.

During this search for a new Director Mr Penrose, who had occupied the position for the past fourteen years, retired on 1 January 1951. Pending the appointment and arrival of a new Director, Mr R. H. Fowler was appointed Acting Director.

Dr C. M. Focken[9] was appointed to the position of Director of the Museum of Applied Science as from 18 July 1951. He was at that time a Senior Lecturer in Physics at Otago University in New Zealand, and his appointment established another interesting link between that university and the Museum. It will be recalled that in 1878 Professor Ulrich had left the staff of the Museum to accept a chair in that university. Then, in 1892 he had recommended one of his students, Mr Walcott, for a position in the Museum and, after Mr Newbery's death in 1895, Walcott had occupied the position of Director for forty years. With Dr Focken's appointment, a second Director had come from Otago University, but he was no stranger to Melbourne when he arrived as Walcott had been almost 60 years earlier. Dr Focken had been educated in Victoria at Wesley College and at the University of Melbourne. He took up duty at the Museum, six months after the announcement of his appointment, on 17 October 1951.

The Chairman of the Trustees of the Museum of Applied Science, in a letter addressed to the Chief Secretary in the following month, said:

> Your Trustees feel that they have been fortunate in securing the services of Dr Focken to be the Science Museum's Director, because of his high academic qualifications, his wide overseas experience and the very high regard in which he is held by all who have known him. And the Trustees feel that, with the present

[7] Annual Report of the Trustees of the Museum of Applied Science, 1950-51. Item 4.

[8] *V.G.G.* no. 12, 5 Jan. 1951, p. 67.

[9] Dr Charles Melbourne Focken, B.Sc.(Melb.), B.M.E.(Melb.), M.S.(Colorado), D.Phil(Oxon), F.Inst.P., F.R.S.A. Now retired officer of the Public Service of Victoria. Born 23 Oct. 1901. Director of the Museum of Applied Science from 18 July 1951 to 24 Dec. 1961.

> nucleus of Technical Staff Officers and the agreement of the Public Service Board to add to this, the communities of Melbourne and Victoria will be provided with a standard of Science Museum worthy of the State, provided sufficient space for display, laboratories for preparation, and storage and workshop facilities are available.[10]

Dr Focken's academic qualifications alone conferred great prestige on the Museum and they far surpassed those of any previous occupant of the position. A graduate in Science and in Mechanical Engineering of the University of Melbourne, he had been Victoria's Rhodes Scholar for 1923; at Lincoln College in the University of Oxford he pursued post-graduate work in physics for which he gained a doctorate of philosphy. Later, he studied geophysics at the University of Colorado where he was awarded the degree of Master of Science. In 1937 he had published a biographical sketch of Lord Rutherford of Nelson;[11] and in 1953, after he had become Director of the Museum of Applied Science, he published another work entitled *Dimensional Methods and their Applications*.[12]

Dr Focken demonstrated by his own performance that a research worker in the laboratory and a scholar in the library can also be a good manager of a large organisation. As an administrator he was dynamic, with no patience for that inert and retarding officialdom which regards "red tape" as an end in itself and the book of regulations as a means for avoiding decision-making. Once he had put his hand to the task Dr Focken showed no disposition to waver or to dissemble. He pointed out that:

> The Museum of Applied Science of Victoria has entered upon a new stage of development which must be vigorously pursued for a period of years . . . The advances in science, and particularly on the applied side, where progress is always accelerated during the periods of grave world unrest, have in the last decade been so rapid and numerous, that no museum has been able to keep pace with them.[13]

In the previous chapter a staff list for 1947 was set out. Since that time the numbers and classifications of the staff had increased and in mid 1952 the situation was as shown hereunder:

STAFF OF THE MUSEUM OF APPLIED SCIENCE[14]

(As at 30 June 1952)

Director	C. M. Focken, B.Sc., B.M.E., M.S., D.Phil.
Senior Assistant	R. H. Fowler, M.Ag.Sc.
Physicist	J. C. Liddy, B.Sc.
Chemist	Appointment pending.[15]

[10] Letter dated 30 Nov. 1951.

[11] C. M. Focken, *Lord Rutherford of Nelson: A Tribute to New Zealand's Greatest Scientist.* (A pamphlet printed by Whitcombe and Tombs, Auckland n.d.).

[12] Edward Arnold, London, 1953.

[13] The Annual Report of the Museum of Applied Science, 1951-52, p. 2.

[14] Annual Report of the Trustees, 1951-52.

[15] Miss Anne Bermingham, B.Sc., was appointed to this position on the 12 Sept. 1952 and she commenced duty on the 5 Nov. 1952. She had previously been employed as a chemist in private industry and with the Melbourne and Metropolitan Board of Works.

Agricultural Scientist	F. J. E. Kendall, B.Ag.Sc.[16]
Assistant (Professional)	N. W. Lewis
Clerk	A. G. Parsons
Museum Technician	S. A. Pick
Assistant, Grade 2	W. Stewart
Laboratory Assistant	Miss S. Joy Dickins, Dip.Art.
	Honorary Staff
Curator of the Telescope	W. L. Clapham
Assistant Curator of the Telescope	R. L. Bryant

To assist in the development of particular collections and in their display to better advantage the Trustees had created a number of advisory sub-committees of experts during the year 1951-52[17], when Mr Fowler was Acting Director. The Advisory Committee on Railways was created under the chairmanship of Lieutenant-Colonel N. C. Harris,[18] and one of the earliest actions of this sub-committee was to recommend the making of scale models of four of Victoria's locomotives—Class Q(1873), American 162 (1877), Class A2 (1908), and Class R (1951). These models were subsequently made and added to the Railways collection. Another sub-committee of officers of the Department of Health of Victoria assisted Mr Fowler with the tasks of planning, creating and developing a Preventive Medicine Section. Mr Fowler has since continued to take a special interest in the maintenance of this section, the expansion of which, however, has been prevented in recent years because of the limitations of space and manpower. Officers of the Department of Agriculture collaborated with Mr Fowler and Mr Kendall in the re-organising and developing of the Museum's horticultural and agricultural exhibits.

At this time Major Millett[19] had been for some years an honorary adviser to the Museum on small arms and other military weapons. Likewise Mr David Little had generously assisted the Trustees by placing his extensive knowledge of sailing ships at their disposal. Another field of interest was brown coal. When the Trustees decided to display a series of exhibits to stress the importance of the brown coal deposits in the Morwell area, two trustees, Sir Walter Bassett and Dr R. S. Andrews gave useful advice.

During the year 1951-52 the Trustees also continued an earlier practice and held a number of special exhibitions to illustrate scientific and historical events of public

[16] Mr Frederick John Edgar Kendall, B.Agr.Sc.(Melb.), M.A.I.A.S., F.R.S.A., Permanent public servant. First appointed to the Museum of Applied Science on 6 March 1952, after two years service with the Department of Agriculture. Commenced duty on 28 April 1952.

[17] Annual Report of the Museum of Applied Science, 1951-52, p. 4.

[18] Lieutenant-Colonel Norman Charles Harris, C.M.G., D.S.O., M.C., M.Sc., (McGill). Born 10 April 1887. Chairman, Victorian Railways Commissioners, 1940-50. Died 3 May 1963.

[19] Major Edward John Millett, R.L., A.M.Inst.T., formerly an officer of the Australian Army Ordnance Corps. In Nov. 1953 he became Honorary Curator of Arms at the Museum of Applied Science of Victoria. Founder of Montrose Cottage and Eureka Military Museum, Ballarat, Victoria.

interest. Prominent among these was the Museum's quite large stand in the Royal Empire Society's exhibition "Our British Heritage" in the Lower Melbourne Town Hall (May 1951). This stand set out a number of key achievements by British scientists and engineers of the past. As had proved to be the case with "Chemex 1947", the vast amount of staff time diverted to this display forced a realization that such commitments to external exhibitions should be limited until such time as the staff could be adequately augmented. Internal exhibitions, however, were continued as a feasible and desirable policy. In June 1951 the centenary of the birth of the British physicist, Sir Oliver Lodge, was celebrated by the Museum with a display at the entrance. Examples of his discoveries and inventions were presented with an attractive art work setting. To celebrate the centenary of the discovery of gold in Victoria,[20] the Minister for Mines, the Hon. G. C. Moss, opened an exhibition in Palmer Hall on the 5 July 1951. It had been arranged jointly by the Museum of Applied Science, the National Museum, and the Public Library.[21] Then in the same hall on the 12 November 1951 the Deputy Premier, the Hon. K. Dodgshun, opened the exhibition to mark the centenary of the separation of the colony of Victoria, on 1 July 1851, from the colony of New South Wales. The Museum of Applied Science contributed exhibits to it which illustrated the part played in Victoria's industrial development by gold mining, rural production, and the exploitation of its brown coal resources. Another special display in that month was arranged at the entrance to the Museum of Applied Science to commemorate the laying of the first submarine cable across the English Channel in 1851 and thus linking England and France telegraphically. The success of this enterprise was due mainly to Sir Charles Wheatstone (1802-75), sometime Professor of Experimental Physics in the University of London, and a replica of his apparatus and also a section of the cable used in this link-up were displayed in the exhibition. Also at the Museum's entrance there was another exhibition which began early in February 1952 to celebrate the centenary of the birth, on 15 December 1852, of the French physicist, Antoine Henri Becquerel (1852-1908) who discovered the phenomenon of radioactivity in 1896 during research work on fluorescence. This discovery was an essential step along the path to the controlled release of nuclear energy. The connection was stressed in the display by depicting an atomic explosion and showing by a sectioned model a possible mechanism for detonating a plutonium atomic bomb.

The discovery of fluorescence was the subject of yet another display in the Museum's entrance. The discoverer, Sir George Gabriel Stokes (1819-1903), was a British mathematician and physicist. As early as 1852 he indicated clearly the physical basis

[20] For an examination of the earliest discoveries of gold in the Colony of Victoria, which was formally separated from the Colony of New South Wales on 1 July 1851, see Geoffrey Serle, *The Golden Age: A History of the Colony of Victoria, 1851-1861*. M.U.P., 1963, pp. 9-12.

[21] The Museum of Applied Science contributed the following exhibits: models of a stamper battery. Wifley ore concentrator, dioramas of the workings of early mines, a horse puddling machine, Chilian mill and a cradle; and also nuggets, specimens and relics of the gold fields including firearms. Gill contemporary water colours on early mining also brightened the display. See Annual Report of the Museum of Applied Science, 1951-52, pp. 4-5.

of spectrum analysis and, in 1878, he expounded the first satisfactory theory of fluorescence and phosphorescence.[22]

The year 1953 was an important one for the Museum in so far as its collection of aircraft and its interest in the promotion of the history of aviation were concerned. In July 1953 Mr A. D. G. Shaw, who was the Melbourne representative of the British Overseas Aircraft Corporation, presented a model of the de Havilland Comet jet air liner on behalf of his company to the Museum. This model illustrated with great clearness just how radically the aeroplane had changed in design and improved in performance even since the termination of the war of 1939-45. At the presentation ceremony the Acting Director, Mr Fowler, brought out a model of a de Havilland monoplane of 1923 and it contrasted even more strikingly, in size and design, with the Comet jet model then being presented by Mr Shaw. Mr Fowler explained that these models were to be included in the forthcoming Jubilee of Flight Exhibition.

Earlier that year, at their monthly meeting in February 1953, the Trustees had decided to form an Aeronautics Advisory Sub-Committee. This sub-committee held a preliminary meeting on 25 March 1953, and, at its first formal meeting on the 15 April 1953, it elected Air Marshal Sir George Jones[23] to be its chairman.

Five days later the Trustees decided to hold a Jubilee of Flight Exhibition towards the end of the year to mark the fiftieth anniversary of the first flight of two brothers, Orville Wright (1871-1948) and Wilbur Wright (1867-1912), on 17 December 1903 at Kitty Hawk in the U.S.A. The planning of this exhibition was left to Air Marshal Sir George Jones'[24] Aeronautics Advisory Sub-Committee.[25]

The exhibits were arranged in a chronological order to show fifty years of phenomenal progress in aviation. The illustrations included numerous charts of aircraft performances, photographs, other printed records and relics. There were aero engines, instruments and items of equipment and a total of about ninety different aircraft models which ranged from those in the kite and glider era to the jet and rocket age. The Fleet Air Arm of the Royal Australian Navy displayed a "Sea Fury" outside the building where it was guarded by a naval sentry. The Department of Civil Aviation set up a model airport, with radio landing aids, which operated as a miniature aeroplane approached and landed. A special feature of the exhibition was a section which illustrated the growth of the Australian aircraft industry during the past fifty years.

[22] Fluorescence has been defined as "the term given to the phenomenon whereby light energy absorbed by a substance is partially re-emitted as light instead of being converted into heat or otherwise dissipated. It is associated with phosphorescence, each a form of "luminescence", but it differs from phosphorescence in that the re-emission of the fluorescent light takes place only as long as the incidental or exciting light falls on the specimen, whereas an excited phosphor may continue to phosphoresce for a considerable time". See T. Thorne Baker "The Chemistry of Fluorescence". *The Industrial Chemist* (London), vol. 30, no. 356, Sept. 1954, p. 427.

[23] On the 22 Sept. 1933 Sir George Jones—then Squadron Leader Jones, R.A.A.F.—had delivered a public lecture in the Industrial and Technological Museum on Fighter Aircraft. (see *The Argus*, 23 Sept. 1933, p. 12).

[24] Air Marshal Sir George Jones, K.B.E., C.B., D.F.C., p.s.a. Chief of the Air Staff, R.A.A.F, 1942-52.

[25] Annual Report of the Museum of Applied Science, 1952-53, p. 3.

One item in the Museum's aviation collection, and one of outstanding importance in the history of aviation, was not included in this exhibition. It should, however, be mentioned here. It was a model of His Majesty's Commercial Airship, R. 101 which had been made some years earlier by Mr G. C. Marshall of Glen Iris. The original airship had been built in 1929 at the Royal Airship Works at Cardington. It was built in accordance with a modified scheme of airship construction, which had been decided on in 1924 and it was the last rigid airship to be built for the British government.

The fate of this airship belongs to the tragic disasters of air history. On Saturday evening, 4 October 1930, the R. 101 left Cardington, with 54 passengers and crew, to proceed on an experimental flight to India. The following morning, at about 2 a.m. and during a storm, it struck a mountain near Beauvais in northern France and was destroyed by fire. Forty-six of the people on board perished. A leader in *The Times* the next day said: "The British Empire has lost not only the latest and biggest product of the science of airship construction, but also a noble company of those who were the repositories of technical skill and knowledge in this branch of aviation". One result of the disaster was the total abandonment in Great Britain of all work on the construction and development of airships and it has not since been resumed.

The Jubilee of Flight Exhibition opened on 10 December 1953 in Palmer Hall. The guest speaker at the opening was Air Marshall Sir Richard Williams,[26] a former Chief of the Air Staff of the R.A.A.F. who, in 1953, was Director-General of Civil Aviation. Air Marshal Williams was one of the first four Army pilots to qualify at the Central Flying School at Point Cook in November 1914. He had, therefore, personally observed in Australia much of the development in aviation which this exhibition was designed to illustrate.

The public welcomed the exhibition with enthusiasm, and in response to many requests night openings were arranged and so a wider circle of people was able to attend. The period of opening covered the Christmas-New Year and school holidays of 1953-54, and large numbers of visitors to Melbourne on holidays and also school children on vacation were able to attend the exhibition. By the time it closed, after a duration of three months, on 6 February 1954, it was estimated that 50,000 visitors had attended.

The Trustees were most appreciative of the assistance given by members of Air Marshal Sir George Jones' Aeronautics Advisory Sub-Committee, consisting of representatives from the Royal Australian Navy, the Royal Australian Air Force, the Aeronautical Research Laboratories of the Department of Supply, the Department of Civil Aviation, the University of Melbourne, the Royal Melbourne Technical College, Trans Australia Airlines and Australian National Airways. All concerned had worked hard to make the display a success, and twelve plenary meetings and numerous sub-committee meetings had been held.

The launching of such a large exhibition had been a rare and beneficial experience both for the members of the Aeronautics Advisory Sub-Committee and for the

[26] Air Marshal Sir Richard Williams, K.B.E., C.B., D.S.O., i.d.c., p.s.a. Born 3 Aug., 1890. Director-General of Civil Aviation, 1946-55.

Museum staff concerned. The stimulus led to a continuing interest by the public in the Museum's Aeronautics section which, since the end of the war of 1939-45, has grown considerably in size and which has been vastly improved in matters of content and arrangement for display purposes. Part of the long-term "fall-out" of this exhibition was the presentation of a number of the models by overseas aircraft manufacturers who had sent them out originally on loan.

During the early stages of the preparations for this exhibition, Dr Focken was granted eight months leave[27] to proceed overseas on duty to study the latest methods of Museum display and administration.[28] He sailed from Melbourne on 13 May 1953; he arrived in London on 21 June 1953 and there his real work began.

No definite terms of reference were laid down by the Trustees for the Director's guidance. He was expected to investigate and to report on all matters that could reasonably be considered to come within the domain of an applied science museum, especially modern display techniques, including lighting, case construction, continuously working and observer operated exhibits, and displays which emphasised the importance to Victoria of primary and secondary industries. Because of existing large collections the Museum had special interest in horology, in arms and in aeronautics. The paramount importance to Victoria of the immense brown coal deposits in the Latrobe Valley was to be the theme of a future display in the Museum. It had also been decided that a radiocarbon-dating service was to be established in the Museum; and for this reason visits to scientists working with this new technique were included. Among the more general topics which the Director was expected to study were the educational services of museums, their publications, programmes and policies, and facilities for storing duplicate and reserve material. Dr Focken was also to examine the best way of expanding into a much larger building if one should become available when the National Museum or the National Gallery moved into a new building on a new site.

Half the time available, approximately three months, was spent in Great Britain and about half of this time was spent in and near London, and in Scotland where almost two weeks were spent. The other three months were divided between three separate tours which were planned to include the best institutions of the kind that the Director was interested in. Geographically, these were: the North European tour—Norway, Sweden, Denmark, western Germany and Holland; the central European tour—Paris, Brussels, Munich, Vienna, Salzburg, Zürich, Lugano and Geneva; and the eastern and central U.S.A. tour—New York, Philadelphia, Washington, Oak Ridge, Denver, Chicago, Detroit, Cleveland, Rochester and Corning.

Dr Focken's overseas tour ended in London where it had begun. He sailed from there on 10 December 1953, reached Melbourne on 6 January 1954, and resumed duty at the Museum the next day. One of his immediate tasks was to complete the writing

[27] The Trustees were informed, by a minute dated 8 September 1952 from the Chief Secretary's Department that: "the Premier had agreed to make funds available to send the Director of the Museum, Dr C. M. Focken, to England and Europe to study new methods of display".

[28] Annual Report of the Museum of Applied Science, 1953-54, p. 4.

of his report for submission to the Trustees. The Trustees subsequently published it, and it is readily available today for reference purposes.[29]

Space does not permit any more than brief references here to a few items in this important document. Early in the report Dr Focken pointed out that: "A Museum of Applied Science must maintain a close and active liaison with secondary industry and must seek to interpret new advances in science and technology for the layman". And so he made a number of visits to selected modern factories which produced either light engineering machines and appliances or scientific instruments and apparatus. In addition to laboratories in the U.S.A. and England that were carrying out radiocarbon-dating work he visited other research laboratories engaged in physical investigations. Dr Focken said:

> My interest lay in Physics and Communications, and it became abundantly clear that expensive equipment, massive high-powered machines, and a great degree of specialisation were now needed to advance the frontiers of knowledge. Teams of scientists, technicians and mechanics had replaced the brilliant, often eccentric individualists who often worked away unmethodically and undisturbed in their own modestly equipped laboratories.

Just before Dr Focken left Australia in May 1953, the Trustees had decided to make funds available to begin the radiocarbon-dating service at the Museum of Applied Science in Melbourne[30] and the preliminary work thereafter in setting up the service was undertaken by Mr Fowler and Miss Bermingham. In October of that year the first work done on radiocarbon dating in England was published. Dr Focken said:

> Soon afterwards I visited the principal workers there, and later, while in the United States, I went to see the work in progress at several of the leading laboratories and at two that were preparing for work. A short report on these visits, during which I was shown the three competing techniques now in use, was published in the *Australian Journal of Science* for August 1954.[31]

Dr Focken went on to say:

> A few words about this new and interesting method may not be out of place. It was discovered by Professor W. F. Libby of Chicago, who, with his colleagues, has provided much evidence in support of the validity of the absolute dates it yields. Time chronology is of the utmost importance to the sciences of geology, anthropology and archaeology. With the techniques at present in use, the age of suitable carbonaceous material as old as 35,000 years has been determined. Improvements being investigated may double this range.

Dr Focken was most impressed by his visit to the Science Museum in South Kensington, London[32] where, he said, there was much to learn and admire and little to criticise.

[29] *Report by the Director to the Trustees of the Museum of Applied Science of Victoria on his Overseas Study Tour, 1953, together with recommendations for the future Development of the Museum.*

[30] Minutes of meeting of the Trustees of the Museum of Applied Science on 20 April 1953, Item 505. See also Annual Report of the Trustees of the Museum of Applied Science, 1952-53. Item 3 (c).

[31] C. M. Focken, "The Radiocarbon Dating Method", *The Australian Journal of Science*, vol. 17, no. 1, 21 Aug. 1954, pp. 10-11.

[32] *The Science Museum: The First Hundred Years.* H.M.S.O., London, 1957.

> This is the museum we in Victoria should seek to emulate when the plans are made to expand into a much larger building. We should have as our objective not the Science Museum of yesterday, or even today, but that of the foreseeable future. For it changes with the years.

He went on to say that:

> Certain galleries, e.g., agriculture, industrial chemistry, the gas industry, have been drastically redesigned and modernised. The Agricultural Gallery was the first completed, and the result, including the remarkable cyclorama above the cases, is strikingly successful. At the time of writing this report, another new gallery devoted to the history of gas manufacture, its distribution and its by-products, has just been opened. These bold innovations result from the policy of encouraging collective effort by industrial companies in the design and finance of appropriate modern displays. Museums in America have carried this policy much further than their British counterparts, and as soon as some space becomes available in Victoria this policy could lead to rapid development and gratifying results.

Features of London's Science Museum, which in Dr Focken's opinion deserved the highest praise, included the following: the staff was highly qualified and numerically strong; the authoritative series of handbooks and descriptive catalogues which it published were useful books of reference of a high order; and the Science Library, which was a department of the Museum, was one of the chief scientific libraries in Great Britain and it was of paramount importance for the Museum's staff and its information service. He found a special attraction in the Children's Gallery of the Museum and said:

> My own observations fully support the oft repeated assertion that children of all ages . . . are entertained and taught by these simple, attractive displays. Well-selected dioramas and easily understood working exhibits combine to provide keen visitors with a better understanding of the world in which we live.

Dr Focken also examined closely the Museum's special and temporary exhibitions and in commenting on them said:

> Those that I saw were remarkably good, and many individuals, firms and bodies outside the Museum had assisted. Although such exhibitions add greatly to the work of the staff, they serve a very useful purpose. Many members of the public, who have rarely or never visited a Museum, may be attracted by some special display. Some of these will become regular callers.

Perhaps it should be mentioned at this point that expert opinion today embodies reservations about the desirability of developing giant museums typified by the Science Museum at South Kensington and the Deutsches Museum at Munich, excellent and impressive though they may be. A museum may be so large as to cause the visitor real dismay at the prospect of ever taking in all it presents in any reasonable time. There is a drift of opinion towards the decentralization, both in terms of subject coverage and location, of museum facilities, particularly towards regional museums serving communities outside capital cities but actively supported by central parent organisations.

Dr Focken expressed strong views on the principles underlying displays:

> A museum is certainly not merely a repository for family heirlooms and doubtful treasures for which there is no room about the house. Only by consciously planning the nature of the displays can museums succeed in becoming great educational forces in the community. Little fault can be found with the principle laid down by Dr Oskar von Miller, the founder of the Deutsches Museum,[33] which is still of great value today. The principle is to show a short evolutionary series of landmarks in all the main phases of sciences and technology, either by the originals whenever possible, or by carefully constructed models and reproductions, and to follow this with a fuller display of the present day applications of each discovery or invention. There is ample scope for variety of treatment and presentation within the limits set by this guiding principle, which leads to a midway course between the extremes represented by the History of Science museums, and the modern type, represented in Chicago and Paris, where present day uses of science are predominant.

Dr Focken did not believe that a "building that has been converted to a museum from its original purposes can be fully successful"; and he believed that the ideal building was a product of "the close collaboration over a period of years of an experienced and well-travelled museum director and a skilled architect whose experience with public buildings has made him more rather than less, receptive to new ideas and suggestions". On the subject of building design Dr Focken said:

> The entrance to a museum should be bright and inviting, not forbidding and gloomy, with massive closed doors. The foyer or entrance hall must be kept comparatively clear, although it is one of the focal points of the institution. There should of course be provision for cloaks and parcels, and an outline directory. This, too, is the appropriate place for the sales counter for publications, illustrations and other mementoes, which should be displayed as close as possible to the service. The most essential publication is a general catalogue of exhibits. In a position of prominence there should be an enquiry desk for an information officer and receptionist, from whom visitors may obtain gratis guide leaflets to the main sections of the museums. It is undesirable to have many officials at the entrance, and signs with regulations or restrictions should be reduced to a minimum.

Further constructive and imaginative comments on this subject were also made by Dr Focken when he said:

> A visitor who has just entered should notice the proximity of the lift and be aware of the fact that it may be used by visitors. Some reasonably comfortable seats or benches near the entrance, but not blocking it, are desirable, and it is just as important to provide seats at suitable places throughout the building. I had ample experience of how rapidly visitors may become footsore or suffer from other forms of museum fatigue. From the foyer an archway might lead to a small hall or rotunda of architectural beauty, which could contain busts of famous scientists or inventors around the perimeter, and possibly a plaque relating to the foundation or the benefactors; but the "hall of fame" or "mem-

[33] J. Zenneck, *Fünfzig Jahre Deutsches Museum, München* (herausgegeben vom Deutschen Museum, München, 1953), p. 5.

orial hall" should not be allowed to become cluttered up, with historic relics or inappropriate gifts. Kept clear it will serve as an impressive setting for formal receptions and social functions.

As already stated Dr Focken's report is much too comprehensive to be dealt with in any satisfactory way in work of this kind. Before leaving it, however, attention should be given for a moment to that section of it which he has headed "Conclusions and Recommendations". In this section he pointed out that:

> We must avoid setting our sights too low. The second quarter of the twentieth century has witnessed a great upsurge in the importance of science and technology. All advanced countries have clearly realised this and they now devote a much larger part of their resources to applied science than at any past time. Consequently, the status of museums of applied science and technology has risen steeply; in Australia it would be foolish and short-sighted to lag far behind. A broad concept, aided by vision and imagination is needed to foresee the future of such museums, which have become essential media for educating the community in the rapid advances which are profoundly affecting their lives.

He also took the opportunity here to draw attention to the long-standing but long neglected need in the Museum of Applied Science for more space by pointing out that:

> Nearly all our present difficulties stem from the acute shortage of accommodation for all purposes—exhibition, storage, staff rooms, and rooms for the production and preparation of exhibits. Furthermore, the introduction of many of the best features of leading overseas museums is only practicable by taking up more of the available space.

Dr Focken then referred to a report by his predecessor, Mr Penrose, by saying that: "I return convinced that the policy adopted by the Trustees of the Museum and set out in 'Lines of Future Development' . . . is fundamentally sound. We have interpreted the term 'Applied Science' very broadly, so in my opinion it would be unwise to extend the range of subjects at present; instead, we should improve and modernise our displays in the major subjects now included". He recognised too that more staff with professional qualifications were required if the Museum of Applied Science was to develop. He said in his report on this subject that:

> An additional laboratory assistant, chiefly for modelling, has already been requested. A graduate in Engineering would fill the most important gap in our team of specialists in the principal subjects included in the Museum. Judged by overseas standards much more could be done in educational and extension services by the Museum of Applied Science. To make this possible it is necessary to appoint an Education Officer who should have a wide experience in the field of education and visual aids. He would serve several purposes: a guide lecturer, a public relations officer, a liaison officer with the technical and high schools and an adviser to the specialist staff on what to show and how to show it. Already the need is apparent for a man experienced in museum methods to act as Keeper of Exhibits. He would co-ordinate the work of those preparing new exhibits and would be responsible for the maintenance of exhibits and also for their registration and the card index. He would also take charge of those, often neglected, subjects that do not come within the orbit of any of the professional

officers. In the near future a second staff member, with qualifications primarily in chemistry, will be required for making tests in the radiocarbon-dating laboratory.

Before making his recommendations Dr Focken drew attention to some domestic burdens of the Museum of Applied Science. He said in one instance: "No one doubts that certain internal improvements in the Museum are long overdue. Although a start has been made on most of them, the effort must be continued and intensified before the general standard is lifted to that of museums of comparable importance in other advanced countries". Dr Focken then pointed to the following defects and deficiencies: the display cases were large and old fashioned and were placed too close to one another; objects were often too crowded in the cases; some displays were too concentrated and were not well arranged; and the lighting was below the standard of modern museums.

Dr Focken concluded his report with a number of recommendations under the following seven headings: Buildings; Policy; Trustees Account; Staff; Exhibition; Maintenance Department; and Admission Charge. He began by recommending that every endeavour be made to obtain a building, of at least four times the present area for the Museum.[34] One of his policy recommendations was that selected Australian industries be invited to sponsor and finance modern displays in the Museum, to be designed by, or in co-operation with, the staff of the Museum. In the matter of staff he recommended the creation of a number of new professional positions, that the position of Senior Assistant be replaced by that of Assistant Director,[35] and that the position of Clerk in the Administrative Division be re-classified. He made a number of recommendations on exhibitions. These included the following: that the number of exhibits that can be operated by the visitor, and also dioramas, be increased; that the work of replacing the least satisfactory of the old display cases with better designed and more attractive cases be accelerated; that the section on atomic physics be improved and that it be expanded by the addition of exhibits on the peaceful uses of atomic energy; and that in re-planning the foyer, provision be made in one of the four corners for a modern display case for the use of the Museum of Applied Science. He also recommended that a small charge be made for admission to the Museum on Sundays and public holidays. In support of this recommendation for an admission charge, Dr Focken pointed out that it was on these days that the most serious overcrowding occurred and that exhibits were usually subjected to the most misuse and damage, and that the Deutsches Museum in Munich had, by making an admission charge and by an effective system of supervision, been able to permit visitors to operate and examine uncased demonstration machines and other apparatus.

[34] It was decided at a special meeting of the Building Trustees on 3 May 1955, that the Museum of Applied Science would occupy the present premises of the National Museum, facing Russell Street, when the Museum's new building was erected in the Domain near the Shrine of Remembrance. This change had not taken place in 1970. See also a letter from the Building Trustees, dated 16 June 1955, to the Chief Secretary on this and other matters.

[35] The Public Service Board agreed to change the designation, "Senior Assistant", as from 22 Feb. 1956, to that of "Assistant Director". See Annual Report of the Trustees, 1955-56, p. 6.

Some of the Director's recommendations in this report have since been either wholly or in some modified form, adopted by the Trustees and implemented. The recommendation concerning admission charges to the Museum was not adopted, however, and so the Museum has continued to admit visitors free at all times, except to the planetarium.

During Dr Focken's absence overseas two new members joined the Board of Trustees.[36] Professor Sir Leslie Martin, who was then the Professor of Physics in the University of Melbourne, and Dr Andrews,[37] who was the Chairman of the Gas and Fuel Corporation of Victoria, were appointed on 15 December 1953. Later, in the Trustees' annual report to the Chief Secretary for the year ended 30 June 1954, the retiring chairman, Sir Fred Thorpe, played an old refrain when he pointed out that:

> With the tremendous scientific development of the last decade how can we say we are providing adequate facilities when our Science Museum is limited to an area one third of that provided for its Natural History Museum or its National Art Gallery.
>
> Since the appointment of a separate Board of Trustees in 1950, your Trustees and Staff at this Museum have collaborated wonderfully in an endeavour to lift the Museum from its Cinderella standing alongside the kindred institutions, and has made great strides in endeavouring to follow the charter laid down in its "Lines of Future Development", but unless we are provided with the space required we can remain with little real progress at all.
>
> You have favoured us with a visit of inspection and know the horribly congested condition under which we are endeavouring to provide and display information for the community at large.

At the Trustees monthly meeting in June 1954, the following office bearers were elected for the year commencing on 1 July 1954: Sir Walter Bassett to be chairman; Sir Fred Thorpe to be deputy chairman; and Mr. O. E. Nilsson to be treasurer.

Sir Walter Bassett[38] was a consulting engineer and company director with special interests in mining and gas companies. He brought academic qualifications and professional experience of a high order to the office of Chairman of the Board of Trustees. A native of Melbourne, he had been educated as Wesley College in Melbourne and studied Engineering at the University of Melbourne. He served in the War of 1914-18 with the A.I.F., at first with the Field Engineers and later in the Australian Flying Corps in which he was seriously injured. In 1919, after he had returned to Australia and was demobilised, he was appointed to the staff of the University of Melbourne as a Senior Lecturer in Mechanical Engineering and Aerodynamics and he held this position, under Professor Henry Payne until 1928 when he went into private practice. The importance of his contributions to the profession of engineering is reflected in

[36] *V.G.G.*, no. 1023, dated 23 Dec. 1953, p. 6372.

[37] Dr Roland Stuart Andrews, C.M.G., D.Sc., M.I.Chem.E., F.R.A.C.I., F.Inst.F., F.A.A. Born 27 Sept. 1897. Trustee of the Museum of Applied Science from 15 Dec. 1953 to 22 Jan. 1961, and Trustee of the Institute of Applied Science from 23 Jan. 1961 to 14 Oct. 1961. Died 14 Oct. 1961.

[38] Sir Walter Eric Bassett, K.B.E., M.C., M.Mech.E.(Melb.), B.E.E.(Melb.), Hon.D.Eng. (Monash), F.I.E. Aust. Chairman of the Board of Trustees of the Museum of Applied Science from 1 July 1954 to 30 June 1957.

the honours that have been bestowed on him. In 1942 he was elected to the office of President of the Institution of Engineers, Australia; six years later the University of Melbourne conferred on him its highest engineering award, the Kernot Memorial Medal, for distinguished services to Engineering, and in May 1970 Monash University conferred on him the honorary degree of Doctor of Engineering. In a newspaper report of this last event it was said he "has completed 50 years' service to tertiary education in Victoria". As chairman of the Trustees of the Museum of Applied Science of Victoria he discharged his duties with skill and efficiency; he showed himself to be a good administrator; he manifested a sound understanding of the Institute's problems, and particularly in matters of staff, buildings, equipment and space for displays and staff accommodation.

Soon after the election of these new office-bearers, a special exhibit was displayed in the Museum to illustrate a newer process for the production of gas. It consisted of a schematic model, and it illustrated visually the Lurgi process for the production of gas from brown coal.[39]

The model was constructed by the staff of the Museum, under the direction of Mr Fowler, and it was designed in accordance with information supplied by the Gas and Fuel Corporation of Victoria. It shows each unit in section, starting with the high-pressure reaction unit and proceeding to the final gas-purification tower from which gas was piped to points for retail distribution.[40] Each stage of the process is explained by a panel of text which is illuminated in sequence by an automatic time-switch.

Above the model a painted panorama has been mounted of the gasification plant, erected by the Gas and Fuel Corporation of Victoria, on a 380 acre site at Morwell. It shows the steam generator, the liquid oxygen plant and the gas drying unit. The first gas produced by this plant began to flow to Melbourne in 1956, and by 1962 the plant's maximum production was about 24 million cubic feet per day. After thirteen years of production it closed down on 26 November 1969. Its product had been superseded by natural gas.

The 31st Congress of the Australian and New Zealand Association for the Advancement of Science in August 1955[41] was of special interest to the Museum of Applied Science for a number of reasons. It was the fifth occasion that the Association had held its meeting in Melbourne, the previous occasion having been twenty years earlier. The Meeting's presidential address was delivered by the Commonwealth Astronomer, Professor R. v. d. R. Woolley, on the subject of "Astronomy and Cosmology".

The Trustees gave approval for graduates of the staff to enrol as members of the meeting and to attend symposia, lectures and excursions which were of interest to them. The Trustees also approved of the Director, Dr Focken, accepting the position

[39] H. Herman, *Brown Coal* (State Electricity Commission of Victoria, 1952), pp. 553-72.

[40] The first successful gas works to produce gas from brown coal, by the Lurgi process, came into operation at Hirschfeld in Germany in 1936. This process was worked out by Professor Rudolf Drawe of Berlin and Dr F. S. W. Danulat of the Lurgi Gesellschaft für Wärme und Chemotechnik GmbH at Frankfurt am Main. See H. Herman, *Brown Coal*, p. 556.

[41] The Congress was held from 17-24 August 1955; its venue was the University of Melbourne.

of honorary secretary of the Congress's Section A (Mathematics, Physics, Astronomy, Statistics and Optometry), the second largest section of the Congress. In the considerable secretarial and editorial work necessary to keep up with the exacting schedule of preparations for the Congress, Dr Focken was assisted by the staff of the Museum. Many visiting scientists called at the Museum during the conference, and in addition, an official party of engineers and architects visited it on the 22 August 1955, in accordance with the Congress programme. The Director entertained the party; he showed them over the Museum and pointed out to them displays of interest. The Trustees subsequently placed on record their appreciation of Dr Focken's work on behalf of the 31st Congress of the A.N.Z.A.A.S. as honorary secretary of its Section A.[42]

Another display which was opened to the public during the year 1955-56 illustrated the evolution of artillery from Roman to modern times. Normally a display of this kind is impracticable because of the space required for the purpose. But in this instance the problem was solved by the use of models and one original field gun—a Krupp gun made in 1878.

There was a tremendous technical change in the design and performance of artillery after the Napoleonic wars. The first rifled breechloading gun was constructed in 1837 by a Swede, Martin von Wahrendorff (1789-1861)[43]. This invention gradually displaced the smooth-bore muzzle-loading gun in the armies of the great powers. The first to take the rifled breechloading gun into use was Prussia in 1860. The Friedrich Krupp Company in Essen was the first manufacturer to produce a successful all-steel gun and it had been displayed at the Great Exhibition in London in 1851.[44] The greater range of rifled guns in turn affected profoundly the methods of employing them tactically.

When the British Expeditionary Force went to war in 1914 it was an army almost without heavy guns. In fact heavy guns had not hitherto been favoured at the War Office in London.[45] In the static warfare, which soon developed in the War of 1914-18, artillery, and particularly heavy artillery,[46] took on a significance unknown in any earlier war. New branches of artillery also came into being and these included anti-aircraft guns, and various types of siege guns.

During the war of 1939-45 still greater technical developments took place in artillery and in particular with anti-aircraft and tank-attack guns. Various types of self-propelled guns for assault and close-support operations were also developed. The experience of this war also indicated that coast artillery had lost its operational role and had become obsolete.[47]

The late C. C. Soden had been commissioned to make the models—a total of

[42] Minutes of Trustees' meeting on 26 Sept. 1955.

[43] *Brockhaus Enzyklopädie* (F. A. Brockhaus, Wiesbaden) vol. 7, 1969, p. 215.

[44] Gert von Klass, *Krupps: The Story of an Industrial Empire* (Sidgwick and Jackson, London, 1954), Chapter 3.

[45] J. D. Scott, *Vickers: A History* (Weidenfeld and Nicholson, London, 1962), p. 99.

[46] See Mark Severn, *The Gambardier* (Ernest Benn Ltd, London, 1930).

[47] The Army Council, London announced on the 17 February 1956, its intention of discontinuing coast artillery in the British Army. See Colonel K. W. Maurice-Jones, *The History of Coast Artillery in The British Army* (Royal Artillery Institution, London, 1959), p.v.

nineteen—for this exhibition. Obviously it is difficult to illustrate the evolution of artillery adequately with such a small number of models; but when more space becomes available it is probable that consideration will be given to expanding the size of this display by adding to it models of guns which are at present not included.

It was obvious to the Trustees at this time that if the Museum was to keep abreast of developments in similar institutions elsewhere in Australia then its staff would have to visit them to meet their colleagues and to study their methods of organising and administering their museums. We have already seen that the Director had recently completed a comprehensive world study tour. Later another senior officer of the Museum, Mr Kendall, went on an interstate study tour. This tour was the first of its kind to be made by an officer of the Museum.

Mr Kendall who, in May 1956 was the Agricultural Scientist, made an official five-day inspection of Museums in Canberra and Sydney.[48] The purpose of this interstate tour was to meet colleagues, to study problems in display work and to obtain information on the dates of firearms and the history of weapons in Australia. In Canberra he visited two widely different museums with quite unrelated functions—the Australian War Memorial and the Australian Institute of Anatomy. In Sydney he visited the Museum of Applied Arts and Sciences, the Mitchell Library, the State Police Museum at Redfern and the Armourers' Museum at State Police Headquarters then on the corner of Phillip and Hunter Streets in the city.

This tour by Mr Kendall was another indication of the Museum's changed policy, in matters of general administration and staff training and development, since it had gained its own board of trustees. In his report of this tour Mr Kendall said: "Discussions with colleagues at the various museums visited yielded much that was profitable . . . both to myself and to the visited"; and "I feel convinced that a regular programme of visiting by the staffs of Australian museums would be profitable to both the staffs and the museums".[49]

The Director carried this report a step further by informing the Board of Trustees that: "Mr Kendall's recent report has reinforced in my mind the need for action to overcome certain deficiencies and difficulties which we have not been able to surmount, although recommendations have been made from time to time". Then he passed from the general to the particular by saying: "three most urgent requirements are: a suitable store of 5,000 to 10,000 square feet within about ten miles from Melbourne; the appointment of a General Assistant, in the salary range of £403-£455, to the staff of the Museum; the appointment of an additional Attendant, in the salary range of £390-£429, so that an attendant could be on duty, exclusively in the Museum, on Sunday afternoons". In addition he recommended the appointment of a guide and

[48] Annual Report of the Museum of Applied Science, 1955-56, p. 15. See also, Minutes of Trustees' Meetings on 28 May 1956 and 25 June 1956.

[49] On the recommendation of the Director a study tour of Tasmania's museums and their collections was made by Mr Kendall in 1961 from the 29 May to 2 June. Mr Kendall submitted a useful report on his work in Tasmania and action was taken by the Board of Trustees on most of the recommendations he made. See Annual Report of the Museum of Applied Science, 1960-61, p. 17. See also File 292A.

lecturer[50] in a part-time capacity.[51] The Trustees took up these four requirements with the Chief Secretary's Department and the proposals were in due course approved and carried into effect.

Later that year, in September 1956, Mr O. E. Nilsson,[52] a Trustee and the Chief Inspector of Technical Schools in Victoria, returned to Melbourne from a visit to Great Britain and the U.S.A. where he had studied the latest developments in technical education. In the following month, on the 22 October 1956, he succeeded Sir Fred Thorpe as Deputy Chairman of the Board of Trustees; and on the 1 July 1957 he succeeded Sir Walter Bassett as Chairman.

It was during Mr Nilsson's chairmanship that the Museum's physicist, Mr J. C. Liddy, attended the five-day Symposium on the Peaceful Uses of Atomic Energy in Australia which was conducted early in June 1958 at the University of Sydney, under the chairmanship of Professor J. P. Baxter, the Vice-Chancellor of the University of New South Wales. The Deputy Chairman of the Symposium was Professor Sir Leslie Martin who was at the time a member of the Museum's Board of Trustees.

This symposium had its origins in a meeting called by the Australian Atomic Energy Commission on 25 July 1957. The meeting was attended by representatives of universities, professional bodies, industrial companies, power authorities and Commonwealth and State government departments. The symposium's object was fourfold. It was to bring together members of scientific and technical organisations and industrial companies who were interested in atomic energy, to serve as a focal point for the various activities in these fields, to report on the progress already made, and to propose new lines of investigation. This meeting also made another important decision, the object of which was to stimulate public interest in atomic energy. It decided to hold an exhibition and to deliver public lectures on atomic energy concurrently with the holding of the symposium.

The invitation to deliver papers at the symposium met with a greater response than was expected; 114 papers were selected for delivery and enrolments numbered 435 persons, including the representative of the Museum of Applied Science.[53] The chairman, Professor Baxter, was satisfied that "The Symposium, exhibition and associated activities made up an active and interesting week, stimulating interest both among those already engaged in these fields and the general public"; and that it marked "a milestone in the development of atomic energy in Australia".[54]

[50] Mr E. F. Halkyard was subsequently appointed to fill this position. See Minutes of Trustees' meeting on 26 Aug. 1957, item 1306.

[51] See Minutes of Trustee's meetings on 25 June 1956, item 1087 and of 23 July 1956, item 1103. See also File 292A/27B.

[52] Oliver Emanuel Nilsson, B.Sc., A.M.I.E. Aust., F.R.S.A., F.A.I.M. Born 3 Nov., 1896 at South Yarra, Victoria. Chairman of the Board of Trustees of the Museum of Applied Science from 1 July 1957 to 30 June 1958. Died 29 June 1968.

[53] Members of the symposium came from near and far. They included 38 overseas visitors who represented government agencies, universities and industrial companies from Great Britain, the U.S.A., New Zealand, Canada and the International Atomic Energy Agency, Vienna.

[54] *Australian Atomic Energy Symposium, 1958: Proceedings of a Symposium on the Peaceful Uses of Atomic Energy in Australia held in Sydney from June 2 to 6, 1958* (published by the Australian Atomic Energy Commission).

Early in the following year, in conjunction with the Railway Commissioners of Victoria, the Museum organised a special railways exhibition in Palmer Hall. Its object was to commemorate one hundred years of government-operated railways in Victoria; and it was conducted for four weeks from Saturday 17 January 1959.

The history of Victoria's government railways began with the Melbourne, Mount Alexander and Murray River Railway Company Act which was assented to on 19 March 1856. This Act empowered the government of Victoria to purchase all the property and other interests possessed by "The Melbourne, Mount Alexander and Murray River Railway Company and other railways at any one time thereafter". The Commissioner of Public Works and the Surveyor-General were appointed trustees of the Department of Railways which was formed by this Act. Another related statute —The Board of Land and Works[55]—was assented to on 24 November 1857. The functions of the Board, created in accordance with this Act, were to construct, inspect and exercise supervision over all public works, including the railways.[56]

One of the immediate tasks of the Railway Trustees, after their appointment in 1856, was to take over the work of completing the Melbourne-Williamstown line, and to do this they ordered rolling stock, bridges, rails and other equipment from England. But the work progressed slowly; delays occurred in the supplying of orders from England and local contractors failed to complete their contracts on time. But at last the Department of Railways' first passenger locomotive made a trial run, on 16 September 1858. The line was opened officially on Thursday, 13 January 1859, when a passenger train of six carriages travelled from Batman's Hill station—now Spencer Street station—to Williamstown, carrying the Governor of Victoria, Sir Henry Barkly, Ministers of State and others.[57] Four days later a regular passenger service began to operate on this line.

The exhibition's object, to illustrate the development of Victoria's government railways from the time of this first journey to Williamstown in 1859 to its centenary in 1959 was achieved. The illustrations included models of steam and diesel-electric locomotives and rolling stock, as well as manuals supplied by the Stephenson Locomotive Works in England for the operation of their locomotives, and a collection of other miscellaneous historical records. The exhibition was extended from the original closing date of Saturday, 31 January 1959, to Friday, 13 February 1959.[58]

In the course of discharging their many duties, the Trustees elect annually their chairman and other office bearers. In this way Sir Laurence Hartnett became Chairman and Mr F. M. Read Deputy Chairman as from 1 July 1958. Sir Laurence Hartnett had been a Trustee since 16 March 1945 and Mr Read since 5 August 1952.

[55] 21 Victoria No. 31.

[56] The Victorian Railways Commissioners Act 1883 (No. 767) was assented to on the 1 Nov. 1883, and it came into force on the 1 Feb. 1884. It provided for the appointment of three commissioners by the Governor-in-Council, and vested in these commissioners the powers, previously exercised by the Board of Land and Works, to construct, maintain and manage the government's railways. See also Leo J. Harrigan, *Victorian Railways to '62* (Victorian Railways Commissioners, 1962), pp. 120-1.

[57] *The Age*, 14 Jan. 1859, p. 5.

[58] Annual Report of the Museum of Applied Science, 1958-59, p. 10.

Sir Laurence Hartnett[59] came from the ranks of top management. He was born at Woking in May 1898 and educated in England. Early in 1914 he became an apprentice engineer at Vickers factory at Crayford and during the later stages of the War 1914-18 he became an officer of the Royal Naval Air Service which was later, on 1 April 1918, amalgamated with the Royal Flying Corps to form the Royal Air Force. It was, therefore, as an officer of the Royal Air Force that he was demobilised from the fighting services to which he had been first appointed as a naval officer. He made his first visit to Australia in 1929. Five years later he came again, but this time to stay. He came in March 1934 as the Managing Director in Australia of General Motors-Holden's Ltd and he held this position for the next twelve years. He was Director of Ordnance Production in the Commonwealth Department of Munitions from 1940 to 1945[60]; and he was concurrently chairman of the Army Inventions Directorate from 1942 to 1946.[61] In a letter to him in October 1946 the Minister for the Army said: "Under your wise and inspiring leadership the organisation which you did so much to introduce and develop on efficient lines, amply fulfilled the high hopes at its inception, and the important functions allotted to it. The Nation's war effort was helped greatly thereby and the political significance of the Directorate's work proved of marked assistance to the Commonwealth Government". In 1945 he became an original member of the newly created combined trust which was appointed to administer the Museum of Applied Science of Victoria and the National Museum of Victoria, referred to, collectively, as the National Museums of Victoria. He has been a continuous member of the Board of Trustees of the Institute of Applied Science since its inception in 1950. In June 1967 he was knighted "for distinguished services to Industry and Government". As a trustee, Sir Laurence Hartnett has shown himself to be a man of ideas, a man of drive, energy and enthusiasm; and he has neglected no opportunities to promote the interests of the Institute either at home or abroad. In particular, his unceasing efforts to establish a planetarium in the Institute can only be described as Herculean, from the first discussions in 1945 to final success in 1965. At frequent intervals he travels abroad on business and during these trips he usually fits into heavy programmes of engagements visits to museums and other organisations with functions of interest to the Institute. He reports the results of these visits to the Board of Trustees if they have any importance to the Museum.

During the first year of this chairmanship, one of the Museum's outstanding events was an illustrated lecture by the distinguished British scientist, Sir John Cockcroft,[62] on "Nuclear Power in the Future". It was delivered on 1 May 1959, in the McCoy Hall of the National Museum of Victoria. The large audience consisted predominantly of members of professional and scientific societies and their friends. Another trustee, Professor Sir Leslie Martin, when introducing the speaker, said of him: "I have had

[59] Sir Laurence John Hartnett, C.B.E., F.I.E. Aust., F.R.S.A., engineer and company director. Chairman of the Trustees of the Museum of Applied Science from 1 July 1958 to 30 June 1960.

[60] L. J. Hartnett, *Big Wheels and Little Wheels* (Lansdowne Press, Melbourne, 1964), p. 110.

[61] *Ibid*, p. 243.

[62] Sir John Douglas Cockcroft, K.C.B., O.M., F.R.S. Born 27 May 1897. Died 18 Sept. 1967.

the privilege of knowing Sir John all my adult life since we worked together, under Lord Rutherford, at adjoining tables in the Cavendish Laboratory".

At the time of this lecture Sir John Cockcroft was the leading British authority on nuclear power; he had first split the atom by artificial means in 1932; he was the Director of the Atomic Research Establishment at Harwell in England from its inception in 1946 to 1959; in 1951 he was awarded the Nobel Prize in Physics; and in 1961 to 1965 he was Chancellor of the Australian National University in Canberra. In this lecture[63] he surveyed the research which had been done during the previous decade in several countries on the controlled release of energy by the fusion of light elements. Illustrated by slides and a documentary film, the lecturer ended with the cautious estimate that it would take at least twenty years before a working fusion reactor was built. Our future may be much more influenced, he said, by this probable achievement than by space travel. After Sir Walter Bassett had moved a vote of thanks to Sir John Cockcroft, the Trustees of the Museum entertained about two hundred guests at supper in the McArthur Gallery of the National Gallery of Victoria.[64]

In April 1960, Sir Laurence Hartnett was granted leave to go overseas and he did not return to Trustees' meetings until December 1960. His term as Chairman expired in June 1960 whilst he was still overseas, and at this date the Museum of Applied Science could look back over a period of unprecedented progress since 1945. This progress had been continuous and systematic and contrasted sharply with that of the seventy-four years from 1870 to 1944. Two factors contributed largely to it. First, the Museum's annual estimates for general expenditure increased considerably after the year 1945-46 in order to maintain and continue this development. Second, additional staff were appointed to make this progress possible. This increase is reflected clearly in the following staff list of the Museum[65] if it is compared with the six staff on the list[66] of, say, thirteen years earlier.

STAFF OF THE MUSEUM OF APPLIED SCIENCE OF VICTORIA
(As at the 30 June 1960)

Director	C. M. Focken, B.Sc., B.M.E., M.S., D.Phil.
Assistant Director	R. H. Fowler, M.Agr.Sc.
Physicist	J. C. Liddy, B.Sc.
Chemist	Anne Bermingham, B.Sc.
Agricultural Scientist	F. J. E. Kendall, B.Agr.Sc.
Physicist (Radiocarbon Laboratory)	R. D. Carman, A.M.T.C.

[63] Tape recordings of the lecture enabled it to be published in *The Proceedings of the Royal Australian Chemical Institute*, vol. 26, no. 6, June 1959, pp. 253-64; and a summary of the lecture, by Dr Focken, was published in *The Australian Journal of Science*, vol. 22, no. 2, Aug. 1959, pp. 63-4.

[64] The National Gallery of Victoria has since moved to its own specially built premises in St. Kilda Road, Melbourne. These premises were officially opened on 20 August 1968 by the Premier of Victoria, the Hon. Sir Henry Bolte.

[65] Annual Report of the Museum of Applied Science, 1959-60.

[66] *Yearbook of the National Museums of Victoria, 1948*, p. 1.

Lecturer	F. A. Doré, B.Sc.
Assistant Professional	N. W. Lewis
Assistant Professional	Erica McFarland
Artist and Modelmaker	Ruth Adams
Administrative Officer	A. G. Parsons
Typist	Shirley Lewis
Museum Technician	S. A. Pick
Technical Assistant	M. E. Hancock
General Assistant	S. E. Ratten

Honorary Staff

Curator of Horology	J. Lowy[67]
Curator of Arms	Major E. J. Millett[67]
Adviser in Astronomy	Dr A. R. Hogg

Uninformed critics may call this "empire building". But there is nothing more unproductive and frustrating, and there is often nothing so futile, as attempts to attain worthwhile ends with inadequate means. Informed critics would probably regard this gradual increase in staff as nothing more than an approach to what was needed for the Museum to discharge its functions promptly and efficiently.

[67] The Museum's annual report for 1953-54, page 4 said: "Two additional honorary officers were appointed by the Trustees in November 1953, namely Major E. J. Millett (Arms) and Mr J. Lowy (Horology). The Trustees expressed their sincere thanks to these gentlemen for their valuable services and numerous gifts to the Museum over a period of years".

Chapter 11

New Horizons (1960-70)

The next financial year opened on 1 July 1960 with a newly elected chairman of the Board of Trustees, Mr F. M. Read[1], a Trustee since 1952 with wide experience in agricultural science and administration which he had gained as an officer of the Public Service of Victoria. After he graduated in Agricultural Science in the University of Melbourne in 1925 with first class honours, he was appointed to the Department of Agriculture and assigned to the Division of Horticulture. This Division had been established two years earlier and he was its first Australian graduate in Agricultural Science. To undertake its research effectively he had the Division extended by the addition of a research branch and his work in this branch was responsible for changes in concepts of soil fertility applied to horticulture and in the use of irrigation in Victoria for agricultural purposes. He was awarded the degree of Master of Agricultural Science in the University of Melbourne in 1927 for a thesis written on his work in this Division. From the outset his career in the Department of Agriculture was one of creative and successful activity.

In that same year he became a part-time lecturer in Horticultural Science in the University of Melbourne and he retained this teaching appointment for the next twenty-five years. In 1936 he was appointed to the Victorian Dried Fruits Board in the dual position of government nominee and deputy chairman and he retained this position for the next twenty years. In 1948 he was sent overseas to study current trends in horticultural research and practice in the United Kingdom, Europe and North America. His reports on this study tour led to many changes in Victoria's horticultural practices.

Another result of his report was a further tightening up of Victoria's procedure for plant quarantine. He was able to influence changes in the procedures of this work as he was at that time the Commonwealth Department of Health's Chief Quarantine Officer for Plants in Victoria. When in 1956 he became the first occupant of the

[1] Mr Frank Morres Read, I.S.O., M.Agr.Sc.(Melb.), F.A.I.A.S., Member of the Board of Trustees of the Museum of Applied Science from 5 Aug. 1952 to 22 Jan. 1961, and member of the Board of Trustees of the Institute of Applied Science since 23 Jan. 1961. Chairman of the Board of Trustees of the Museum of Applied Science from 1 July 1960 to 22 Jan 1961; and Chairman of the Board of Trustees of the Institute of Applied Science from 23 Jan. 1961 to 30 June 1962 and from 1 July 1967 to 30 June 1969.

Department's new position of Deputy Director of Agriculture he stimulated in-service training of professional, technical and administrative officers of the Department, and he maintained this interest after he became, as Director of Agriculture in 1961, the Department's Permanent Head.

His extra-departmental interests were extensive. He was on two occasions Chairman of the Australian Standing Committee on Agriculture. In 1940 he was President of the Victorian Branch of the Australian Institute of Agricultural Science; in 1965 he became its Federal President; and since 1963 he has been a Fellow of the Institute. He was a member of the Council of the University of Melbourne from 1961 to 1967; a member of that University's Faculty of Agriculture from 1961 to 1967, and of its Faculty of Veterinary Science from 1962 to 1967, and President of the Melbourne University Graduate Union in 1946. He is a Fellow of the Royal Institute of Public Administration, and an honorary life member of the Royal Agricultural Society of Victoria. He was a member of the Advisory Council of the C.S.I.R.O. from 1961 to 1968, and was also, prior to his retirement from the position of Director of Agriculture in 1967, a member of the Commonwealth Dairy Industry Research Committee and of the La Trobe University's first Advisory Committee on the establishment of its degree course in Agricultural Science. Since his retirement Mr Read has been the government nominee on one of the boards created under the "Marketing of Primary Products Act" and more recently he has been appointed a member of the Town Planning Appeals Tribunal under the Town and Country Planning Act 1962.[2]

Three months after Mr Read became chairman, the Trustees obtained by gift the original Thomson steam car. At the Trustees' meeting on 24 October 1960, the Director reported that the maker's widow, Mrs Mary Thomson, who had died a short timer earlier, had bequeathed the vehicle[3] to the Museum.

Herbert Thomson of Armadale[4] had designed and built the car in the 1890's. It was the product of much designing and experimenting over a period of several years. Thomson made motor engineering history, it was said, when, on 6 July 1896,[5] he wheeled the car out of his workshop in High Street, Armadale to give it its first road trial.[6] Three years later, in August 1899, it was reported that:

> Mr Herbert Thomson, of Armadale, Victoria, may safely claim to be the first person in the colonies to construct a really workable motor carriage. For some months past it has been known that the motor carriage which Mr Thomson has been in the course of the past two years experimenting with, has proved to be the complete success which its inventor anticipated. For the past few weeks it

[2] For biographical sketch see *The Journal of Agriculture, Victoria*, vol. 65, part 9, 1967, pp. 365-7. See also Frank M. Read, "Enormous Advances since the Day of the Man and his Horses", ibid, pp. 368-371.

[3] This car was known, originally, as the "Thomson motor phaeton." (see *The Australasian*, 12 Aug. 1899, p. 363).

[4] Herbert Thomson, Electrical and mechanical engineer. Born 13 June 1870, at Toorak, Victoria. Died 26 Oct. 1947 in Melbourne. See *The Argus*, 27 Oct. 1947, p. 5, for short obituary.

[5] It has not been possible to verify this date.

[6] P. M. Ulyatt, "Our First Car: A Masterpiece". *S.M.H.*, 27 July 1963, p. 13.

> has been running on the streets of Melbourne, exciting no little admiration on the part of those who have seen it, both from the smoothness with which it runs and also on account of the almost complete absence of those distressing accompaniments of some of the experimental cars which appeared some time ago—noise and smell.[7]

A contemporary description said Mr Thomson's motor carriage resembled a village phaeton with pneumatic tyres; it was made with three seats which were mounted over three elliptic springs; the motive power was steam, generated by a kerosene fire; the motor, though remarkably light and compact, could develop power up to five horsepower, and the total weight of the carriage, including the motor, was only ten hundredweight. It had a top speed of 25 m.p.h., with a fuel and water cruising range of 25 miles; and it could carry six persons on level roads and four on other roads.

Thomson was quick to grasp that the motor car had developmental possibilities; that it was extending its markets in Europe and the U.S.A., and that it would have an important and far reaching effect on Australia's future transport development. Early in 1900 he formed the Thomson Motor Car Co. Ltd in Melbourne, and he became Australia's first commercial motor car manufacturer.[8] It was announced in July 1901 that this company had placed a new model on the market with a maximum speed of 20 m.p.h. and its price was £300.[9] The buyers of this later model of the Thomson car included Melbourne's General Post Office, its Metropolitan Fire Brigade, and Dr G. J. Hodgson of 149 High Street, St Kilda.[10]

But to return to the first model—arrangements were made for Herbert Thomson's daughter, Mrs Olivia Stening of Sydney, to present it formally to the Trustees at a ceremony at the Museum of Applied Science on Thursday afternoon, 27 October 1960,[11] and today the car is one of the popular exhibits in the Verdon Hall.

During Mr Read's chairmanship the name, Museum of Applied Science of Victoria was changed by statute[12] to the Institute of Applied Science of Victoria, the change becoming effective on 23 January 1961. The Chief Secretary explained to the Legislative Assembly that the Trustees believed that it was likely that there would be less confusion in the public mind if the Museum of Applied Science of Victoria and the National Museum of Victoria had more distinctive titles.[13]

The Chairman of the Trustees, Mr F. M. Read, also commented on the change. He said:

[7] *The Australasian Coachbuilder and Saddler*. 15 Aug. 1899, p. 82.

[8] It has been claimed that Colonel Harley Tarrant, and his partner Howard Lewis of Melbourne "built the first entirely Australian made car". (see "76 Years of the Australian Motor Car", *The Age*, 28 July 1970, p. 21). But this claim is incorrect, according to the *Australian Encyclopaedia*, Angus & Robertson, Sydney, vol. 6, p. 178.

[9] *The Australasian Coachbuilder and Wheelwright*, 15 July 1901, p. 69.

[10] This information was supplied by Herbert Thomson's daughter, Mrs Olivia Stening.

[11] The Thomson car was restored to its original condition by Mr W. A. Buchanan of Dennis, Victoria. Dunlop Australia Ltd supplied, free of cost, a replacement set of tyres which had to be hand made.

[12] Act no. 6688, assented to on 6 Dec. 1960—State Library National Gallery National Museum and Institute of Applied Science Act 1960.

[13] *V.P.D.*, 11 Oct. 1960, vol. 261, session 1960-61, p. 543.

> The change in name is intended by the Trustees to indicate some change in the overall objectives of the Institution, or, should I say, to give recognition to a change which has been proceeding over the last few years. The Trustees considered that the name "Museum" suggested an emphasis on the notable scientific and technological achievements and relics of the past, and that the name "Institute" would better suggest our current wish to contribute to the scientific enlightenment and education of the people of Victoria in the portrayal of the great current advances in science. A recent estimate suggests that one-third of a million visitors come to the Institute each year. The opportunity to bring modern scientific thought before our people is, therefore considerable.[14]

Another welcome announcement was made by the chairman about the long-standing problem of space. He described as "a further notable event . . . the completion by the end of June 1961, of the north-west wing of this building"; and he pointed out that this work had not only completed the façade and increased the architectural beauty of the building's Swanston Street frontage but it had also provided the Institute with two additional halls on the first and second floors, and additional working accommodation for the staff on the third floor.[15] This wing was officially opened later that year. The Director, Dr Focken, was also pleased with the trend of developments and in referring to this new accommodation he said: "This was the first and only major increase in display and working space during the ten years I have been associated with the Institution."[16] There were two other notable events in that year. One was the substantial gift which the Trustees received from the Sunshine Foundation for the purchase and erection of a planetarium. The other was the opening of the long awaited radiocarbon-dating laboratory for the determination of the ages of carbonaceous samples within a period extending backwards for about 40,000 years.

The Institute's radiocarbon-dating laboratory was officially opened on 9 May 1961 by the Chief Secretary, the Hon. Sir Arthur Rylah. In introducing the Minister to a group of interested scientists and representatives of research institutions and others who had come to witness the opening, the chairman of the Trustees, Mr F. M. Read, outlined the Trustees' policy for developing and modernising the Institute; he described the Institute's struggle since 1954 to establish the radiocarbon-dating laboratory; he referred to the project as a pioneering one in Australia and he pointed out that its establishment had demanded a great deal of patient work and skill from the Institute's staff over a period of seven years.[17] He expressed later the optimistic view that: "Now that we are in a position to receive specimens for dating, the volume of inquiries for this service is a measure of the contribution the Institute will now be

[14] Annual Report of the Institute of Applied Science, 1960-61, p. 3.

[15] Ibid.

[16] Ibid, p. 5.

[17] Dr Focken visited some radiocarbon-dating laboratories during a study tour overseas in 1953. Miss Anne Bermingham, the officer-in-charge of the Institute's laboratory, also inspected a number of radiocarbon-dating laboratories overseas a few years later. After Mr Carman's appointment to the Institute's staff in 1958 he was sent to work at the well-established radiocarbon-dating laboratory of the Department of Scientific and Industrial Research in New Zealand to become familiar with their techniques and the operation of their equipment.

able to make in a scientific field in which Australia has had to rely on overseas laboratories."[18]

The Chief Secretary reviewed the reasons which led the Government to support its establishment. It represented, he said, an investment in highly specialised scientific equipment and in skilled staff to operate it;[19] it would supply a need which had long existed in Australia; and it would henceforth be available for research workers not only in Australia but also in neighbouring countries in the South-West Pacific area.

The Director, Dr Focken, described in simple terms, with the aid of large colour charts, the process of radiocarbon-dating and he explained its importance to geochronologists and students of pre-history. The main principle involved was simple to understand but it had required, he said, the insight and the persistence of Professor W. F. Libby of Chicago to see its possibilities and to bring them to fruition—work for which he was awarded a Nobel Prize in 1960.[20]

The official opening of the Institute's new North West Wing by the Chief Secretary, Sir Arthur Rylah, took place on 22 November 1961. When introducing the Chief Secretary, the chairman of the Trustees, Mr F. M. Read, said:

> This is a red letter day and, we hope, a turning point in the history of the Institute of Applied Science of Victoria. As a result of a Technological Commission report of 1869,[21] and an Act of Parliament of December, 1869 "to provide for the incorporation and government of the Public Library, Museums, and National Gallery", the Industrial and Technological Museum was established in 1870 and housed in the Great Hall of the Intercolonial Exhibition of 1866-67. In 1893 the Industrial and Technical Museum occupied the newly built and magnificent hall which is now the McCoy Hall of the National Museum.
>
> In 1899 the National Museum of natural history which had previously occupied the building at the University which is now the east end of Union House, was given approval to move into the McCoy Hall and the Industrial and Technological Museum was completely dispossessed and its activities completely suspended for 13 unlucky years—the second Dark Ages as some have described them. Others have likened this visitation to a temporary eclipse of the achievements of Man by the lower animals.
>
> During this dark period enlightened leading citizens agitated without pause for the reopening of the Industrial and Technological Museum; but not until 1912 were they successful, through a deputation headed by Mr (later Sir John) Monash and the Hon. George Swinburne, in persuading the Premier of the day to provide another home for it.
>
> The new home was this Queens Hall built and used as a library until the new Octagonal Library was built and the Public Library moved into it in 1913. Here

[18] Annual Report of the Institute of Applied Science, 1960-61, p. 3.

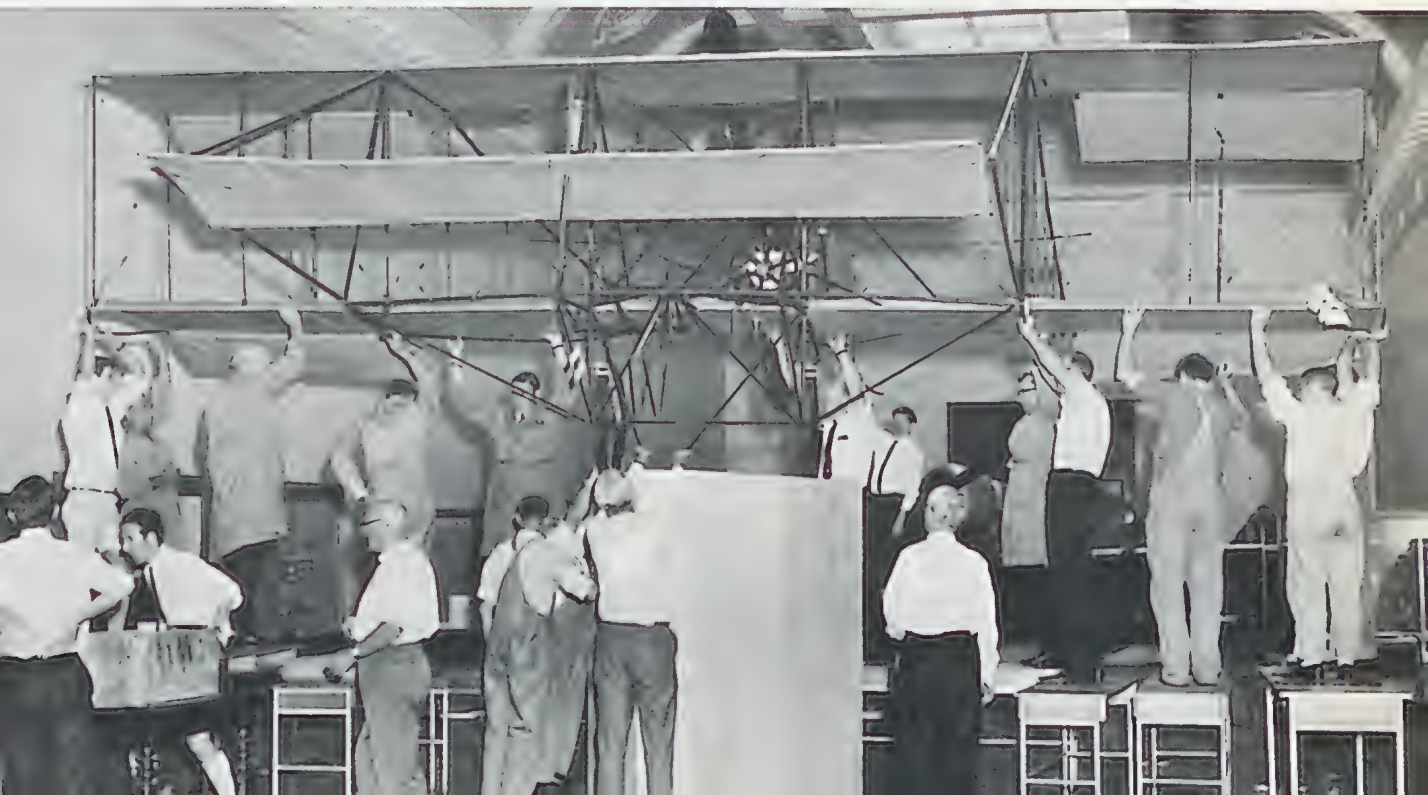
[19] See also R. D. Carman, "Stabilization of the Overall Counting Sensitivity of a Gas-filled Proportional Counting System" (*The Australian Journal of Science, April, 1961*), and Anne Bermingham, "Victoria: Natural Radiocarbon Measurements I" (*Radiocarbon*, vol. 8, 1966), pp. 507-21.

[20] Charles Focken, "The Radiocarbon Dating Method" (*The Australian Museum Magazine*, vol. 13, no. 10, 15 June, 1961), pp. 327-31. See also C. M. Focken, "Radiocarbon Dating Laboratory: Museum of Applied Science of Victoria" (*The Australian Journal of Science*, vol. 23, no. 4, Oct. 1960), p. 127.

[21] First report of the Technological Commission of Victoria, dated 17 Feb. 1869. Published by the Technological Commission in *Reports and Papers*, 1870, p. 3.

PLATE 69. Lifting the Wirraway into the McArthur Hall, January 1970.

PLATE 70. Installing the Duigan Aircraft in the McArthur Hall, February 1970.



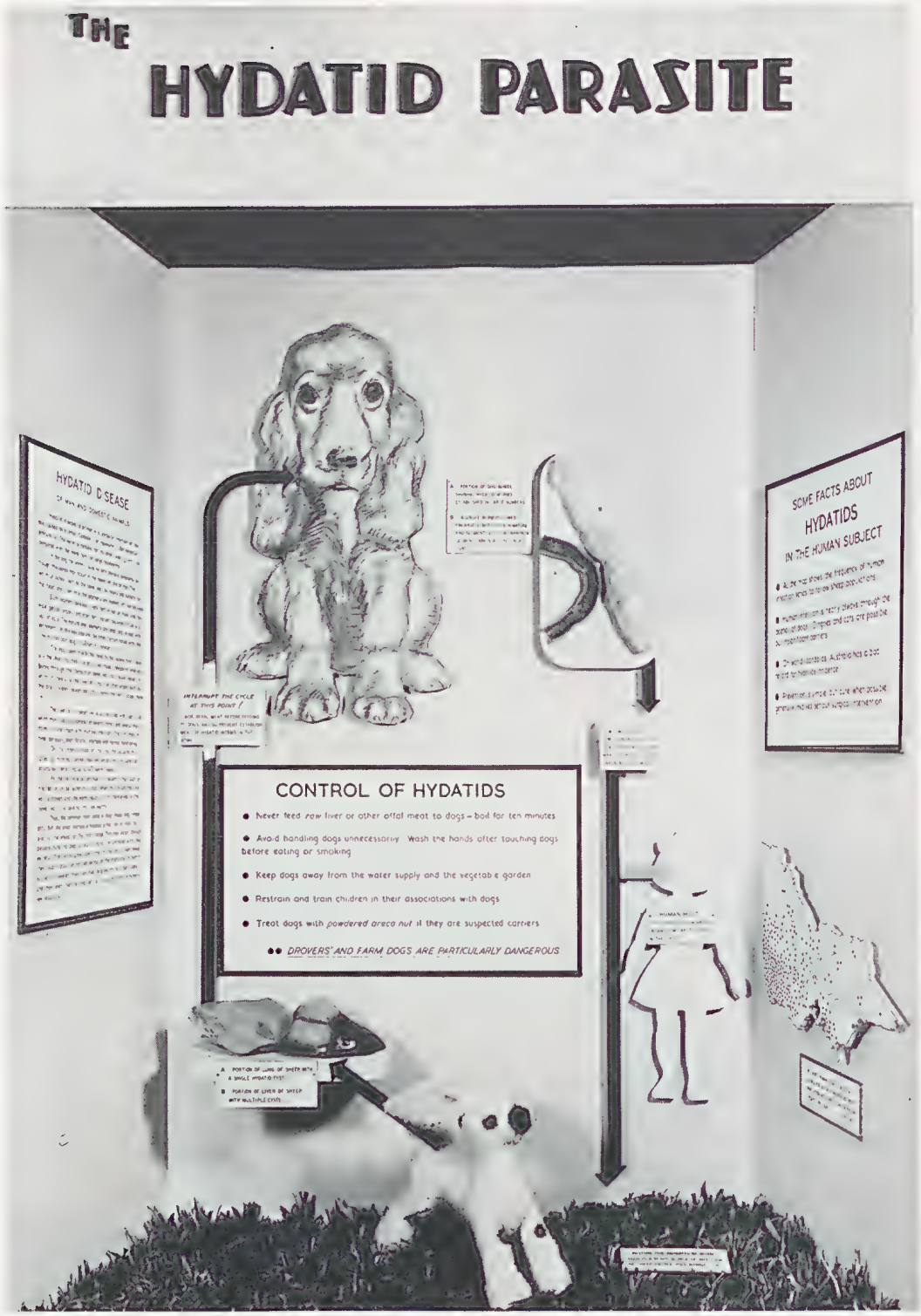

THE
HYDATID PARASITE
HYDATID DISEASE
SOME FACTS ABOUT
HYDATIDS
IN THE HUMAN SUBJECT
CONTROL OF HYDATIDS
● Never feed raw liver or other offal meat to dogs – boil for ten minutes
● Avoid handling dogs unnecessarily. Wash the hands after touching dogs before eating or smoking
● Keep dogs away from the water supply and the vegetable garden
● Restrain and train children in their associations with dogs
● Treat dogs with powdered areca nut if they are suspected carriers
●● DROVERS' AND FARM DOGS ARE PARTICULARLY DANGEROUS

PLATE 71. Graphic presentation conveys an important message in the public health section.

A ROCK FROM THE MOON
You are about to see a rock from the moon, part of
the 22 kilograms of lunar samples which Astronauts
Neil Armstrong and Edwin Aldrin collected from the
Sea of Tranquility on their historic Apollo 11 mission.

PLATE 72. The Director, Mr. R. H. Fowler, and Deputy Director, Mr. F. J. E. Kendall, examine a rock from the moon, October 1970.

PLATE 72A. Portion of the Museum's centenary display mounted in the Bank of New South Wales, Swanston and Collins Streets, in September 1970.

PLATE 73. Mr. D. F. Marshall, Lecturer, explains the Cook Bicentenary Display to Her Majesty the Queen, 8 April 1970.

PLATE 74. Public interest after the presentation of a replica of Henry Ford's 1896 *Quadricycle*, 29 July 1970.

PLATE 75. Guests at the opening of the centenary year in the McArthur Hall, 7 April 1970.

PLATE 76. His Excellency Major-General Sir Rohan Delacombe, Governor of Victoria, presents the junior prize in the model-making competition to Master Robert Sherlock, 11 September 1970.

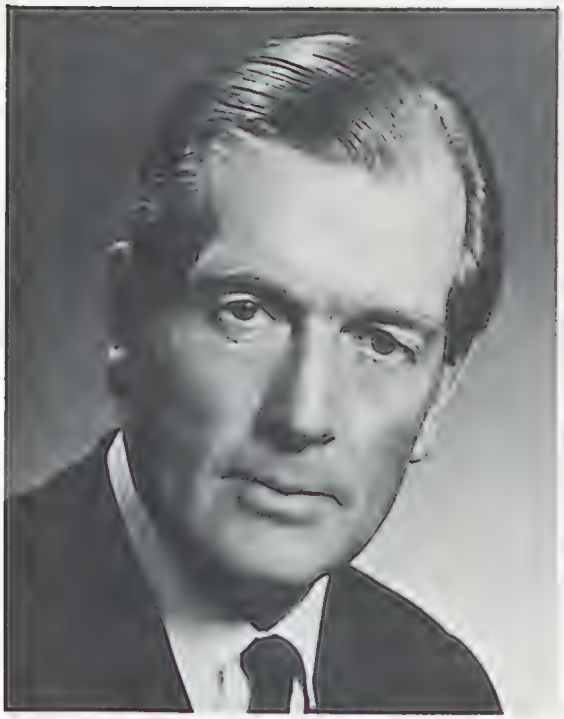


PLATE 77. David Ronald Zeidler.
Centenary year Trustee. Appointed 1964.

PLATE 78. Dr. Phillip Garth Law.
Centenary year Trustee. Appointed 1968.

PLATE 79. His Honour Judge Roland John Leckie.
Centenary year Trustee. Appointed 1968.

PLATE 80. John Morton Turner.
Centenary year Trustee. Appointed 1969.

PLATE 81. Her Majesty Queen Elizabeth II, signs the visitor's book at the Museum, 8 April, 1970.

we have lived for 48 years cheek by jowl with ever more and more crowded exhibits and with a further store of exhibits in a shed we rent from the Melbourne Harbor Trust down by the docks. In this period our name was changed by Act of Parliament on the suggestion of Trustees—first to Museum of Applied Science in 1944 and in 1960 to Institute of Applied Science.

The completion of the north west corner of this fine old building was first proposed by Trustees in 1952; but not until 1958 in the previous term of office of the present Victorian Government were plans commenced. With the completion of the work, this hall together with a similar hall above it, and above that again a floor of workrooms has been added, as a most welcome addition to our Institute.

However, even with these additions, the Institute of Applied Science still occupies only 33,000 of the 270,000 square feet approximately, of floor space which is divided between the four institutions housed within this centre—the others being the Public Library, National Museum, and National Gallery. Thus we still look forward to the time when we can occupy the space vacated by the National Gallery after its move to Wirths Olympia. Our Director estimates that we have one-third of a million visitors to the Institute each year. It is a challenging task to endeavour to meet the needs of every one of them—to satisfy their interests in the classic achievements of the past and lead them in an understanding of the rapid advances and needs of this scientific age. The display in the new Hall now to be opened, though not yet in its final form, does, for a limited section of science and human achievement, aim to do this. It also gives some indication of scope for improved methods of displaying our exhibits which will become possible when we inherit the long awaited accommodation now occupied by the National Gallery.

We warmly welcome our many guests and well wishers this afternoon and are most happy to have with us Mr Cecil McKay who, as you are aware, was responsible for the recent magnificent gift to the Institute of £20,000 by the Sunshine Foundation for the establishment of a planetarium within the Instititute. The optical work is already in the hands of the Goto Optical Company of Japan.

Dr Focken, who had been the Director of the Institute for the past ten years, relinquished the appointment and retired from the Public Service of Victoria on 24 December 1961. The chairman of the Trustees, Mr F. M. Read, expressed appreciation of the work of Dr Focken and he referred to the great progress which the Institute had made during the years that he was its Director. Sir Walter Bassett, Sir Laurence Hartnett and Mr Nilsson—all past chairmen of the Trustees—endorsed the chairman's appreciation of Dr Focken's services.[22]

Mr Fowler,[23] the Institute's Assistant Director, succeeded Dr Focken in the position of Director. When Dr Focken took over the management of the Museum in 1951 it had been trying strenuously during the previous five years to remove the marks of earlier years of neglect and stagnation which had been brought about by inadequate financial support, insufficient staff both in numbers and in varieties of skills and professional training, and a want of adequate space for display and administrative purposes. All these deficiences had had an adverse effect on the morale of the staff,

[22] Minutes of Meeting of Board of Trustees on 20 Nov. 1961.

[23] Mr Richard Hindle Fowler, M.Agr.Sc.(Melb.), M.A.I.A.S., F.R.S.A. Permanent officer of the Public Service of Victoria. Director of the Institute of Applied Science since 20 March 1962.

whose labours were performed in an environment where good work went, it seems, unrewarded and unrecognised. No Director since Newbery's time has been mentioned in a Queen's periodical honours' list. But Dr Focken, by hard work and perseverance, had seen these conditions change for the better. He was able therefore to hand over to Mr Fowler an administrative machine which was operating in more space, had better organisation and it was more adequately staffed and better equipped than it was ten years earlier.

But maintenance and development are continuing processes; and they demand the unflagging direction and control of the Director. Under Mr Fowler's management the Institute has continued to grow and flourish. Each Director, since the Institute was first opened a hundred years ago, has been drawn from a different profession. Mr Newbery was a chemist, Mr Walcott a mineralogist, Mr Ninnis a civil and electrical engineer, Mr Penrose an engineer and draughtsman, and Dr Focken was a scientist who specialised in physics. Because of differences in personality, education and training, each of these Directors looked at his tasks from a different point of view, and these differences reflected themselves in work habits and in the nature of development as a whole under each of them. Obviously these differences usually brought diversity and benefits to the Institute's long-term development. Mr Fowler, the first to join the ranks of the Directors from the agricultural science profession, is an officer with wide scientific and cultural interests. He graduated in Agricultural Science with Finals Honours at the University of Melbourne in March 1931. Soon afterwards, in April 1931, he commenced duty in a research appointment in the Chemist's Branch of the Department of Agriculture and there he specialised for five years in soil physics and chemistry in relation to plant nutrition. For a thesis on part of this work he was awarded the degree of Master of Agricultural Science in the University of Melbourne in 1936. In that same year, in May 1936, he was appointed to the staff of the Industrial and Technological Museum in the position of Assistant (Botanical) which, as an economy measure during the great depression then coming to an end, had remained vacant since Mr W. D. Wilson's death in April 1932. Soon after his return to the Museum in 1945 from wartime duties in the Commonwealth Department of Munitions on explosives research, Mr Fowler became Senior Assistant. He was again promoted in 1955 to the rank of Assistant Director. He thus brought to the position of Director in March 1962 the experience of twenty-six years of active participation with his two predecessors—Mr Penrose and Dr Focken—in the Museum's struggle to advance and develop in accordance with the demands of the time. Nor did he have any illusions, when he became Director, of the magnitude of the tasks which lay ahead and of the arduousness of the road along which he had to travel.

Mr Fowler has contributed papers to museum periodicals and has written technical pamphlets for public release in the Museum.[24] He is a member of the Council of

[24] These include: "Allies and Enemies in the Plant Kingdom" (*The Young Farmer Annual, 1947*); "Melbourne's Malaria Exhibition" (*Museum*, vol. 3, no. 4, 1951); "The Restoration of a Marble Bust" (*Museum's Journal*, May 1955); "A Showcase Trolley System" (*Museum's Journal*, June 1968); and a variety of leaflets for distribution to visitors to the Museum.

Adult Education of Victoria; and interests in classical music are reflected in his membership of the Board of Management of the Grainger Centre at the University of Melbourne and in the presentation of a series of lunch-hour recitals of recorded music in the Institute from 1950 to the end of 1963. He was a foundation member of the Health Education Committee of the Department of Health of Victoria and this interest was extended to the preventive medicine section of the Museum's displays, which he set up, and to supplement which he wrote the pamphlet *Your Food* of which many thousands of copies, in three editions, have been distributed.

Mr F. M. Read's second term of office as chairman expired on 30 June 1962. From 1 July 1962, Emeritus Professor Sir Leslie Martin[25] occupied the office of chairman. He had been the Professor of Physics in the University of Melbourne from 1945 to 1959 and from 1958 to 1968 he was associated with the Australian Atomic Energy Commission—at first as a member and later as Deputy Chairman.[26] From 1959 to 1966 he was chairman of the Australian Universities Commission. He thus brought to his duties as chairman of the Board of Trustees wide experience in advanced scientific research and in teaching at the tertiary level, as well as considerable high level administrative experience.

As chairman, Sir Leslie Martin soon discovered that he was obliged to continue the unending battle of his predecessors for more floor space. But he was able to conduct this campaign with more favourable long-term prospects. In previous years the lack of storage space and display space, and the improbability of more becoming available, had restrained the Trustees in their efforts to acquire larger space-consuming exhibits. An indication was given in February 1962,[27] however, that the National Gallery of Victoria had taken a positive step in its long-term planning to build new premises in another part of the city. Part of the space which the National Gallery would in due course vacate in the Swanston Street building would then become available to the Institute of Applied Science. The unknown factor at this stage was how much space would be gained in the re-allotment. Nevertheless, the Trustees relaxed their restrictions to some extent on the acquirement of larger space-consuming exhibits.

It was in these circumstances that the Institute was able to take action to acquire a Wirraway aeroplane for exhibition purposes. The opportunity first arose in October 1963 when the Assistant Director, Mr Kendall, was visiting the training establishment of the R.A.A.F. at Point Cook. During the visit he saw a Wirraway which had been "written off" for destruction and he recommended to his own Director that an approach be made to the Department of Air to have this aeroplane preserved and presented to the Institute. Negotiations stretched out, however, and in the meantime one of the Trustees, Sir Laurence Hartnett, took up the matter. He had been a Director of the

[25] Emeritus Professor Sir Leslie Harold Martin, C.B.E., Ph.D., D.Sc., LL.D., D.Litt., F.R.S., F.Inst.P., F.A.A. Chairman of the Institute of Applied Science from 1 July 1962 to 4 Nov. 1963.

[26] The Australian Atomic Energy Commission. Sixteenth Annual Report, 1967-68, p. 94.

[27] The first contract for the National Gallery's new building was one for extensive excavations, drainage, and the driving of fifteen miles of pre-cast reinforced concrete piling into the site for the new building which was on the former bed of the Yarra River. The contract was let, in Feb. 1962, to John Holland (Constructions) Pty. Ltd.

Commonwealth Aircraft Corporation Pty. Ltd at Fisherman's Bend since its inception in 1935 until 1947 and so, on behalf of the Trustees of the Institute, he approached that company for a Wirraway. This approach produced better and quicker results and the Institute's request to the Department of Air was withdrawn. The Corporation agreed to restore a Wirraway to its exact original service condition and to present it to the Institute. Furthermore, it offered to house the aeroplane in a Corporation hangar for a reasonable time and in this way the Institute's immediate storage problem was solved.

The Wirraway aeroplane[28] was officially handed over to the Institute by the chairman of the Commonwealth Aircraft Corporation, Lieutenant-General Sir Sydney Rowell, at a brief ceremony, on 17 January 1963 at the Corporation's grounds in Fisherman's Bend. It was received on behalf of the Trustees by two former chairmen, Sir Laurence Hartnett and Mr O. E. Nilsson. The occasion was marked by news features on Melbourne's television and radio-broadcasting stations and in the press.

The Wirraway was a fighter-trainer aircraft. It was an Australian version of the American NA-33 aircraft which was manufactured by North American Aviation Incorporated. It was built by the Commonwealth Aircraft Corporation and it marked the beginning of mass production of aircraft in Australia. The first Wirraway to come off the Corporation's production line was flown on 27 March 1939 and four months later it was officially taken into use by the R.A.A.F. The Wirraway played a significant part in enabling Australia to meet its commitments under the Empire Air Training Scheme; it made possible the supply of 16,000 trained air personnel by March 1943 and the supply of further quotas subsequently. Its production ceased in 1946.[29]

In his first annual report, as chairman, for the year ended 30 June 1963, Sir Leslie Martin drew attention to four things: first that the Director, Mr Fowler, had completed his first year of office "with distinction"; second, that the Director had the support, not only of an enthusiastic staff, but also that of numerous honorary helpers; third, that the Institute had made significant progress towards the achievement of its proper place in the community; and fourth, that because "national advancement today is integral with scientific achievement" the case for an equitable share in the space to be vacated soon by the National Gallery gained more and more weight. But he said, with disappointment, on this fourth point that "our negotiations for this additional space have received disconcerting opposition".

Later that year, in November 1963, Sir Leslie Martin relinquished the office of chairman and in the following month he resigned from the Board of Trustees[30] because of ever growing demands on his time from other quarters. He had been an active member of the Board for the past ten years, despite ever increasing responsibilities, including his appointment to the position of Chairman of the Australian Universities Commission in 1959. He had placed his services freely at the disposal of

[28] This particular Wirraway—an aboriginal work meaning "challenge"—had a wing span of 43 feet, a gross weight of 5,575 lbs and a top speed of 220 m.p.h. Its serial number was A20/651; and its construction was completed on 14 June 1944.

[29] For details of the Wirraway's speed, range, armament, etc. see Douglas Gillison, *Royal Australian Air Force, 1939-1942* (Australian War Memorial, Canberra, 1962), p. 54, n.1 and p. 719.

[30] *V.G.G.* no 97, 18 Dec. 1963, p. 3679.

the Trustees; and his experience in atomic physics and in the development of science for defence purposes gave him unique qualifications as a Trustee. He was succeeded for the remainder of his term as chairman by a past chairman, Sir Fred Thorpe, who was later re-elected chairman for the following year commencing on 1 July 1964.

It was during Sir Fred Thorpe's chairmanship on this occasion that Sir Walter Bassett retired from the Board of Trustees. His appointment as a Trustee expired on 15 March 1964 and, in accordance with his wishes, it was not renewed. Sir Walter Bassett was an original member of the separate Board of Trustees which had been formed in 1950. But his services to the Institute did not begin with his becoming a Trustee—the Institute's files bear witness to his enthusiastic support of and sustained interest in the Institute since his return from the War of 1914-18.[31] The Institute owes him a special debt for his part in helping to make the planetarium project a reality—a part concerned with the raising of funds to pay for it and in technical guidance during its installation and its initial period of operation.

His Honour Judge Read[32] succeeded Sir Fred Thorpe as chairman on 1 July 1965. Judge Read brought many good and useful qualities and qualifications to the office of chairman. He was an efficient chairman who could make difficult problems simpler and easier to understand by the processes of analysis and explanation. He was a man who blended humility with considerable personal charm and wide scholarship; he came often to the Institute to acquaint himself with the nature of its various collections; and he knew each member of the staff by name. Indeed, he went to extraordinary lengths to make himself an efficient and useful chairman and member of the Board.

It was during Judge Read's chairmanship that the H. V. McKay Melbourne Planetarium was opened in the Institute. Some may ask—what is a planetarium? The answer is that it is an instrument for displaying the phenomena of the visible heavens, and the main pattern of the skies can be shown at any selected point of time. A lecturer can select many hundreds of combinations of celestial bodies and, by means of a complex projector which casts images of the stars, planets, comets, moons and the sun on to a domed ceiling, he can speed up or slow down their movements. In these ways he can carry audiences, in a matter of a few minutes, through days, years and centuries of either the past or the future.

The first suggestion for the establishment of a planetarium in Melbourne was contained in an article on the Melbourne Observatory written by Mr John D. Keating of Fitzroy and published in *The Age* on 8 May 1943. On 27 March 1945 he wrote to the Trustees[33] of the National Museums and suggested that provision be made for

[31] Correspondence from John Coates & Co. Ltd., Victoria House, Melbourne Place, London dated in 1921 and 1922 shows that Mr W. E. Bassett was then in London purchasing aero engines and related equipment on behalf of the Industrial and Technological Museum in Melbourne.

[32] His Honour Albert Leonard Read, C.B.E., LL.B. Judge of County Court and Chairman of General Sessions in Victoria, 1945-65; and Chairman of County Court Judges of Victoria, 1960-5. Born 31 March 1893 at Camberwell, Victoria. Trustee of Institute of Applied Science from 31 Jan. 1962 to 17 Dec. 1968. Chairman of the Institute of Applied Science from 1 July 1965 to 30 June 1967. Died 23 Aug. 1970.

[33] Annual Report of the Institute of Applied Science, 1964-65, p. 15.

a planetarium to be included in the new Museum building planned for the site in the Domain. At the Trustees meeting in April 1945 it was agreed in principle that a planetarium be established. At their meeting in May 1945 the Trustees appointed a sub-committee consisting of the President, Mr Russell Grimwade, Mr L. J. Hartnett and Colonel F. G. Thorpe to "attend to matters relating to the proposed construction of a planetarium in Melbourne".[34]

The Melbourne Planetarium became a particular interest of Sir Laurence Hartnett. As the full-sized Zeiss instrument then on the market was beyond the Trustees' reach for reasons of cost, he proposed that the wartime Optical Munitions Panel (which he had created and administered with spectacular success during the war) should be kept together for peace-time schemes such as planetarium production. The Trustees' sub-committee followed up this proposal, and much overseas correspondence with experts and overseas companies followed. By June 1946 the sub-committee reported that a planetarium could be established in the Museum of Applied Science for £100,000, including the costs of making a projector and providing the building and services.

In 1947 the support of Sir Harold Spencer-Jones, who was the Astronomer Royal, was enlisted. Sir Laurence Hartnett was also briefed to make further enquiries overseas in that year. He reported with enthusiasm results of his mission abroad to the Trustees in November 1947.[35] Some months later the sub-committee presented a further report and it became clear from this report that insufficient finance would remain an insuperable barrier to the Trustees in their efforts to provide a planetarium for the public. This situation persisted without any immediate prospects of remedying it.[36] Nevertheless, the matter was not allowed to drop. Early in 1958 Professor Sir Leslie Martin procured a publication on the Zeiss planetarium which indicated that smaller and less costly instruments had come on to the market. When the north-west wing was under construction early in 1960, Dr Focken recommended that the spacing of the roof girders be modified to accommodate, when required, a dome of 20 feet in diameter and this was agreed to.[37]. However, the financial barrier to the obtaining of the desired projector still persisted.

A significant upsurge of interest in planetaria took place in 1960. Mr John Perdrix, at that time the President of the Astronomical Society of Victoria, gave an address to that society in February of that year and in his concluding remarks he urged that a meeting of all persons and organisations interested be held to draw up a plan of campaign the object of which was to obtain a planetarium for Melbourne.[38] The

[34] Minutes of the Board of Trustees of the National Museums of Victoria, 17 May 1945.

[35] At a meeting of the Trustees of the National Museums on 20 November 1947, Mr L. J. Hartnett reported on inquiries he had made in the U.S.A. and on the Continent concerning the construction of a planetarium in Australia. See Minutes of Meeting, Item 390.

[36] The planetarium project was dealt with as a National Museum of Victoria matter until 1958. Then it was formally transferred to the Museum of Applied Science.

[37] In retrospect it can be regarded as fortunate that this area was not developed. In terms of size and accessibility it would have been grossly inadequate.

[38] J. L. Perdrix, "A Planetarium for Melbourne" (*The Journal of the Astronomical Society of Victoria*, vol. 13, no. 2, April 1960), pp. 20-25.

Royal Society of Victoria was persuaded to follow this up and a special meeting was held on 18 October 1960. Among those present were representatives of the University of Melbourne, the Royal Melbourne Technical College, the C.S.I.R.O., the Trustees of the Museum of Applied Science, the Melbourne Rotary Club, the Melbourne City Council, the Department of Education, the armed forces, the Astronomical Society of Victoria, the Victorian Branch of the British Astronomical Association and a number of interested persons. The proposal to establish a planetarium in Melbourne—not necessarily in the Museum of Applied Science—was strongly supported at the meeting, and to carry on the business of this meeting a sub-committee of the Royal Society of Victoria was appointed. Its convenor was Dr C. M. Focken and its other members were: Mr Jackson of the Department of Education, Mr J. L. Perdrix of the Astronomical Society of Victoria and Dr Anderson of the Melbourne Rotary Club. They drew up a report in some detail but they deferred the making of a recommendation as to the precise location of the planetarium in Melbourne. The old and familiar problem of finance still persisted.

Meanwhile other factors began to operate which resulted in a happy ending. Mr C. N. McKay offered by letter, to the Director of the Museum, Dr Focken, the historic smithy of his father the late H. V. McKay I.[39] Dr Focken accepted the offer on behalf of the Trustees. In a further letter, dated 28 October 1960, Mr C. N. McKay expressed his thanks to the Museum authorities and mentioned that:

> In a talk with Sir Walter Bassett I enquired whether the Trustees of your Museum had in mind any special project for which the Sunshine Foundation[40] might consider offering support. He mentioned that enquiries were being made overseas regarding a planetarium—which I understand is available in several sizes.
>
> Trustees of the Sunshine Foundation have expressed interest in such a project and I am taking this opportunity to let you know that our next meeting has been fixed for Friday, 16 December next.

No time was lost by Dr Focken in providing Mr McKay with a detailed report of the Museum's proposals and problems for the establishment of a planetarium. Soon afterwards the unexpected happened and the Trustees and the Director were, figuratively speaking, swept off their feet by the receipt of the following letter from the Sunshine Foundation, dated 22 December 1960, to the Director of the Museum of Applied Science:

> Dear Dr Focken,
>
> At a meeting held last week the Trustees gave consideration to the proposed Planetarium for the Museum. The Trustees were impressed with the brochure

[39] Hugh Victor McKay, C.B.E., inventor of the Sunshine Harvester. Born 21 Aug. 1865 at Raywood, Victoria. Died 21 May 1926 at Sunbury, Victoria.

[40] The Sunshine Foundation was set up by his two sons, H. V. McKay II and C. N. McKay, and his daughter, Dame Hilda Stevenson. It should not be confused with the H. V. McKay Charitable Trust, set up years before by the terms of the will of H. V. McKay I.

and your report and I am pleased to inform you they have allocated the sum of £20,000 for this project.

If you could give me some indication of when you anticipate you will need the money, it would be appreciated.

Yours faithfully,

R. B. Mollison.
SECRETARY

In April 1961 the Trustees of the Institute of Applied Science placed an order for a Goto "MI" projector. Then another problem emerged and awaited a solution. The total estimated cost, on which the Sunshine Foundation gift was based, presumed that the planetarium would be set up somewhere within the existing buildings. Dr Focken had earlier discussed location with the Director of the National Gallery of Victoria and he had become confident that the east end of the McArthur Gallery would be made available several years in advance of the scheduled time of departure of the National Gallery to its new premises. A request for the area to be formally transferred came before a meeting of the Trustees of the National Gallery in November 1961 but it was strongly opposed. Neither the Public Library nor the National Museum had sufficient space available to assist. No over-riding decision followed, at the level of the Building Trustees, later that month, although the issue was not finally settled.

At the end of 1961 Dr Focken elected to retire and Mr Fowler was appointed Acting Director of the Institute of Applied Science. Determined to find a way out of the impasse, Mr Fowler surveyed all possibilities for a new location for the planetarium. The plan which he evolved was supported by the Architect for the Public Works Department, Mr R. Rahni, the Trustees of the Institute of Applied Science, and the Building Trustees. It entailed the construction of an auditorium at first-floor level in the corner of the courtyard formed by the walls of the Barry Hall and the Queen's Hall. As two of the needed four walls were already there, the expected costs of construction were minimal. Only two pillars were needed to support the perched structure. However, any such extra costs incurred meant an all-out effort by the Trustees of the Institute of Applied Science to cheapen construction, for the funds it could add to the Sunshine Foundation's gift were meagre.

Fortunately, the Chief Secretary agreed that the Trustees' retain all future net earnings of the planetarium, and from this point onwards the planetarium's construction proceeded more or less smoothly to completion. The building construction was carried out by A. R. P. Crow and Sons Pty. Ltd, the seating was done by Aristoc Industries Pty. Ltd and the dome was built by the Commonwealth Aircraft Corporation Pty. Ltd. The dome, which is 33 feet in diameter, demands special comment. As an economy measure the contract was limited to the construction only of the fibreglass sections and suspension hoop. These were delivered to the site where members of the staff bolted them together and finally hoisted the structure to its working height and attached the suspensions. This was an exacting task and it called for very careful planning and execution, but it was completed without any mishaps. The dome made

history in the planetarium field for it is believed to have been the first wholly suspended planetarium dome of substantial size ever to be installed.[41]

Soon after the construction of the planetarium began, the Trustees of the Institute of Applied Science appointed an honorary committee under the chairmanship of Mr Raynes W. A. Dickson. It included the following members: Councillor E. W. Best, Sir Laurence Hartnett and Messrs J. Cook, R. H. Fowler, W. H. Lempriere and J. Lowy. Mr Dickson's committee assisted materially in planning and was successful in raising further outside support for the planetarium.[42] It became clear by May 1965, however, that although the Museum would have a functional planetarium it would be one which was sub-standard in some important respects. On being told of this situation, Mr C. N. McKay and his fellow-trustees of the Sunshine Foundation provided an additional £4,000 to remedy all deficiencies.

The day of the planetarium's official opening approached. Mr D. F. Marshall, the Institute's Lecturer, and Mr A. R. Cavill, the Education Officer (Astronomy) had already spent some months of study and practice in operating the Goto projector and supplementary features of the planetarium when the Trustees announced that it would be officially opened on Thursday afternoon, 2 December 1965.

On that day the opening ceremony was carried out by the Chief Secretary, Sir Arthur Rylah. The ceremony took place in the Institute's Queen's Hall in the presence of about 180 invited guests, including three members of the late H. V. McKay's family. These were his only daughter, Dame Hilda Stevenson; his son, Mr Cecil Newton McKay, and his daughter-in-law, Mrs C. N. McKay. In introducing the Chief Secretary, Judge Read thanked the McKay family, on behalf of the Trustees, for their generosity through the Sunshine Foundation for financial support which had made the creation of the Institute's planetarium possible.

The Chief Secretary, in declaring the planetarium open, named it the "H. V. McKay Melbourne Planetarium" to perpetuate the name of McKay and the generosity of the Sunshine Foundation. He also commended the Trustees on their imaginative conception and their determination to give the State this important new asset. He foresaw in the planetarium, he said, a new means for promoting education at primary, secondary and tertiary levels and also in special training organisations including those of the Navy, Army and Air Force and the Department of Civil Aviation.

The Director, Mr Fowler, described the planetarium as "a new concept in educational entertainment". Mr A. R. Cavill, a teacher of the Department of Education of Victoria attached to the staff of the Institute of Applied Science, said of the planetarium that:

> As an educational adjunct the machine has tremendous value, and as a teaching aid it is unique, enabling the operator to illustrate almost any aspect of astronomy.

[41] For further information see G. Friend, "Planetarium's Sky is Fibreglass" (*Australian Civil Engineering*, vol. 8, no. 10, 5 Oct. 1967), pp. 33-35.

[42] Westminster Carpets Pty. Ltd., supplied and laid the entire carpeting free of charge; Central Theatre Co. Pty. Ltd. presented extra seating from the old Capitol Theatre lounge; Carlton and United Breweries Ltd. gave £350 for electro-acoustic equipment.

> At the touch of a switch[43] the stars drift steadily westward as night and day pass in a matter of minutes. The apparent motion of the planets is graphically portrayed by accelerated motion of the mechanism, while variations in latitude can be arranged so that the night sky can be viewed from any location on the surface of the earth.[44]

The planetarium has been a success from the outset. It has attracted both young and old to its sessions and by 1969-70 attendances had reached impressive figures. The total attendance for 1969-70 was 56,697 at 817 sessions;[45] it was an increase of 3,246 over the figures for 1968-69.

In June 1965 the Bank of New South Wales approached the Trustees with a most excellent and generous proposition. Some time previously the Bank had prepared a card planisphere for distribution in Queensland, and it now proposed to prepare a version for Victorian latitudes and produce them for distribution in the H. V. McKay Planetarium. This offer was accepted by the Trustees with gratitude and the supply has continued unabated. This continuing gift has assisted very materially in the planetarium's financial success, many thousands of this admirable educational device having been supplied since the inception of the idea.

The Planetarium activities, together with the Observatory service, have made the subject of astronomy a major interest of the Institute. This development has been further stimulated by the spectacular developments in space exploration and their controversial offshoot—interest in "unidentified flying objects". One result is a growing demand from members of the public for astronomical information of all kinds. This demand is met by the Lecturer, Mr D. F. Marshall, and the Education Officer (Astronomy), Mr A. R. Cavill. Calendar and diary printers require advance information on moon phases; lawyers require authoritative rulings on sunrise and sunset times for accident cases; architects require information on shadow sizes and angles, while the press and public turn to the Institute for information on astronomical phenomena, particularly when an eclipse is pending or an unidentified flying object has been reported.

In May 1967, towards the end of the chairmanship of Judge Read, the Deputy Director of the Institute of Applied Science, Mr John Kendall,[46] set out from Melbourne on a study tour in overseas countries. His object was to study planetaria, and modern trends in museum organisation and administration and in particular staffing and the latest techniques for displaying exhibits. This was the second time, in the

[43] For a description of the electrical installation which permits the planetarium's complete optical projection system to be operated by remote control from a console see J. C. Liddy and G. Friend, "Some Electrical Features of the H. V. McKay Melbourne Planetarium" (*Electrical Engineer*, Melbourne, vol. 44, no. 10, 10 Oct. 1967) pp. 9-13.

[44] A. R. Cavill, "Melbourne's H. V. McKay Planetarium" (*The Journal of the Astronomical Society of Victoria*, vol. 21, no. 6, Dec. 1968), pp. 95-100.

[45] The total general public attendance in 1969-70 was 23,351 in 427 sessions, and the school attendance of 33,346 was attained in 390 sessions, many of which included more than one school party. The total number of school parties in the 390 sessions was 495. For a more detailed classification of school attendances see the Annual Report of the Institute of Applied Science 1969-70. Schedule D.

[46] Deputy Director of the Institute of Applied Science of Victoria since 6 July 1962.

Institute's long history, that a senior officer had gone overseas on official business connected exclusively with the Institute.[47]

Mr Kendall's first important stop was made in Moscow. From there he visited Warsaw, Belgrade, Milan, Munich, Hamburg, Paris, London, Liverpool, Edinburgh, Montreal, Bridgeport, New York, Washington, Chicago and Tokyo. With the exception of Montreal, which he visited to inspect Expo '67, each of these cities had at least one important science or general museum. In Bridgeport, Chicago, London, Moscow, Munich, New York, Paris and Tokyo there were also planetaria and Mr Kendall visited them as well as planetaria at Bochum, Greenwich and Montreal. He reached Melbourne again in August 1967 after an absence of three months on a strenuous but thought-provoking and stimulating study tour.

His immediate task was to prepare a report on the results of his tour and to make recommendations for the application of the knowledge and experience he had gained. The report was informative, comprehensive, illustrated with photographs and administratively useful. He was convinced that the standard of the Institute's more recently produced displays, including sectioned engines and scale models, compared favourably with the best he had seen overseas. The Institute's education service showed up well in comparison with similar services overseas. In general, museums abroad tended to leave school groups to their own devices, and such visits are less profitable than the organised and conducted tours which the Institute provides.

Mr Kendall found vast changes occurring overseas in the methods of presentation in museums. The old system of displaying as many variations of each object as could be packed into a sombre, unlighted showcase had been discarded in all leading museums. Instead, the services of the architect, the designer and the artist were being combined with those of the scientist to produce attractive and instructive displays. However, these displays are more costly. They demand more and specially trained staff, as well as more floor space than the older methods, both for preparation of exhibits and for their display. Mr Kendall said that what he viewed on his visit to the Metropolitan Museum of Art in New York "was proof indeed of the value of good displays".

He believed too that, whenever possible, the personal involvement of the visitor with the display increased his interest in it. More use should be made, he said of "question-and-answer" types of displays, and of demonstrations and working models which can be operated by the visitor. Often a more successful participation is brought about if the visitor can turn a handle to produce the desired effect rather than having to rely on time switches and electric drives. In planning the layout of galleries the channelling of visitors through a sequence of exhibits should be avoided. In overseas museums which Mr Kendall had visited, attemps to marshal visitors in this way had not been successful and some visitors tended to be irritated by them. Experience indicates that people sometimes prefer to "swim against the stream" and so passage-ways should be large enough to permit a two-way flow.

[47] The Director, Dr Focken, went on an official overseas study tour in 1953. The Institute's first Director, J. C. Newbery, went on an overseas study tour in 1891 but it was on behalf of the Department of Mines of Victoria and not on behalf of the Industrial and Technological Museum.

Mr Kendall found too that, apart from museums in the United Kingdom and the United States, it was a common practice for museums to charge for admission. In most instances, however, the charge was nominal and its object was rather to exclude undesirables than to supplement income. At the Deutsches Museum in Munich, for example, the entrance and cloakroom charges from 900,000 visitors in 1965 amounted to only 8% of its total income. Earlier Boards of Trustees of the Institute had considered proposals to make admission charges, but each time they were rejected for various reasons.

In the larger museums that Mr Kendall visited he found that their reference libraries had increased in importance and had gained a new place in their programmes of administration, public relations and research. He found too that these large libraries were operated by professionally trained staffs under competent management. Few things can be more exasperating and more time-wasting to users of scientific libraries, or indeed of any reference libraries, than the efforts of persons in charge, however well-intentioned, who are not professionally trained in library administration. Mr Kendall recommended that a qualified librarian be appointed to the Institute's staff. But no financial provision has yet been made for such an appointment despite its importance and the urgent need for it.

But other parts of the report indicated that, for a State the size of Victoria, the Institute fell behind prevailing standards of science museums overseas. The first handicap was that of its physical size. The Institute's space was insufficient to enable its exhibits to be displayed in sufficient quantities and to the best advantage.[48] The second handicap, when Mr Kendall compared the Institute with its counterparts overseas, was the paucity of its holdings of historically important scientific exhibits. This is of course due, to some extent at least, to Australia's relatively short history as a scientific and industrial nation and also to a neglect in the past to preserve items of importance.[49] But much can yet be saved for future generations by conducting campaigns to preserve material of historical significance which has been discarded but which can still be salvaged, and to preserve material of historical significance if it becomes available in the future.[50]

[48] The Institute of Applied Science of Victoria will, according to current plans, get more space when the National Museum of Victoria moves to its new premises. But no date has yet been fixed for the building of these premises.

[49] Earlier, in August 1953, the Chairman of the State Rivers and Water Supply Commission, Sir Ronald East, made a similar proposal for the preservation of rail locomotives, machinery, and the like, and, more specifically, the historic Cannie Ridge irrigation pump near Swan Hill. The proposal was examined sympathetically by the Trustees at the time, but it was clear that limitations of storage and display space would remain as a formidable barrier to the acquisition of any substantial number of such items. (See Appendix G for the text of Sir Ronald East's letter.) It may be noted however, that good alternatives to older central museums pursuing this function are being developed to an increasing extent. Rail locomotives, steam tractors and rollers, aeroplanes, agricultural machinery and similar large items are being collected and preserved by municipalities and societies, both in suburban areas and country towns. The Cannie Ridge pump was in fact later set up at Lake Boga by the State Rivers and Water Supply Commission as an historic memorial, dedicated to the irrigation pioneers by the Acting Premier on 28 May 1959. A special example is the planned restoration and preservation of the three-masted barque "Polly Woodside", a project of the National Trust of

Other points made in the report have since been embodied in current plans for developing the new display space which is becoming available. They include the need for a better subject classification for use in individual galleries, the provision of rest areas for visitors, the provision of better workshop accommodation and equipment, better storage space for the Institute's reference library, and better accommodation for the staff.[51]

Staff and finance remain, as in the Institute's earlier years, its major immediate needs. The extent and urgency of these needs are made plain by comparisons with similar organisations overseas. Mr Kendall quoted the example, for purposes of comparison, of the Smithsonian Institute at Washington. There ten people had worked for six months on the preparation of exhibits to be displayed in its new agricultural gallery, and yet the installation of these exhibits had required the services of eight more persons for two months. This task, he estimated, would have been only about a quarter of the total volume of work going on throughout all the display galleries at any one time. The Institute's relatively smaller staff and the total amount of space it has at its disposal, however, make it impracticable for it to mount displays on the grand scales of those at the Smithsonian Institute.

With regard to overseas planetaria, Mr Kendall believed that the Institute's planetarium was comparable, except in size, with those seen overseas, and that its projector, accessories and methods of presentation compared favourable with those overseas also. However deficiencies in the Institute's services to the public showed up unfavourably when compared with those provided in overseas planetaria. Particular deficiencies were insufficient diversification in programmes and a relative paucity of material to sell over the counter such as booklets, photographs, postcards and slides. The Institute's publicity for its planetarium and its other services is also insufficient and therefore largely ineffective.[52]

While progress has been made with the completion of a number of the recommendations made in Mr Kendall's report, all the deficiencies in the Institute to which he drew attention can be remedied and they need not continue. More staff with a wider range of skills and greater financial support for the work it is doing can raise the Institute's status in the community and increase the range and standards of the services it provides for the public.[53]

Australia (Victoria). The Science Museum supports this project through the membership of the Director (R. H. Fowler) on one of the sub-committees.

[50] The Swan Hill Folk Museum at Horseshoe Bend, Swan Hill is doing important work in this field. This Museum was officially opened on the 29 Sept. 1966 by the Premier of Victoria, Sir Henry Bolte. See also Ross Holloway, "The Growth of a Folk Museum" (*V.H.M.*, vol. 39, nos 1 & 2, Feb-May 1968), pp. 52-59.

[51] By 1970 better accommodation had been obtained for the staff and the library.

[52] The Annual Report of the Institute of Applied Science, 1967-68, p. 18.

[53] In December 1968 Mr F. J. E. Kendall, Deputy Director of the Institute of Applied Science, attended a Symposium on Museum Architecture at Mexico City, at the invitation of the International Council of Museums. During this tour he inspected the National Museum of Anthropology in Mexico City and also museums and planetaria at Auckland, Honolulu, Los Angeles and San Francisco.

His term of office as chairman having expired, Judge Read was succeeded by Mr F. M. Read on the 1 July 1967. These trustees were not related, except by a common surname. Judge Read was the second trustee to come from Victoria's County Court bench. The first was Judge Bindon who, almost a century earlier, had become the first chairman of the Committee of the Industrial and Technological Museum. He had been elected to this office after he had made considerable efforts, personally, as Chairman of the Technological Commission of Victoria in 1869, to have the Museum established as soon as it was.

Mr Read, a trustee since 1952, assumed office as chairman in the manner of a veteran for he had been chairman on two previous occasions, in 1960-61 and in 1961-62. During his chairmanship on this third occasion the National Gallery vacated the building, in Swanston Street, which it had shared for almost a century with the Institute of Applied Science, the Public Library and the National Museum, and moved to its new premises in another part of the city. Mr Fowler drew attention to the significance of this occasion by saying that it "was a momentous one for the National Gallery, marking the beginning of a grander era of service in art to the State with ideal new quarters, augmented staff and modern facilities".[54] But the move also meant much to the three institutions left behind in the old building. It meant the provision of nearly 60,000 square feet of vacated floor space to be divided between the State Library, the National Museum and the Institute of Applied Science. But this apportionment presented difficulties and, as Mr Fowler said, it "proved to be more than a simple exercise, involving sectional interests and the weighing of claim and counter-claim".[55] The tug-of-war resulted in the National Museum being allotted the Stawell, McAllan and La Trobe Galleries; and in the Institute of Applied Science being allotted the balance of the National Gallery area and the McArthur basement. Against this gain, however, had to be debited the Institute's loss of the Queen's Hall which it had occupied for more than fifty years, and the North-West Wing. The Building Trustees allotted these two areas to the State Library. The effect of this decision was that every exhibit of the Institute and all its accommodation for offices and preparation of exhibits and the necessary equipment had to be set up in new locations. Mr Fowler said:

> The Institute faces a removal task comparable with that of the National Gallery. In some ways it is a greater task as the move will not be essentially a mere re-location of a number of existing exhibits. The plan is to create a new science museum which will be in tune with the times and needs of the people. The new theme will not be the "popularisation of science".[56] This is being carried out by the mass media at an intensity never seen before, and all too often in a harmful unbalanced way.

Mr Fowler then pointed out that:

> It will be the aim of the Institute to avoid the sensational and selective approach

[54] The Annual Report of the Institute of Applied Science, 1967-68, p. 7.
[55] Ibid, p. 7.
[56] Editorial, "Some Limits to Popular Science", *Endeavour*, London. vol. 15, no. 58, April 1956, pp. 59-60.

> so popular with the television and press magazines". The aim is more properly to give insight into the scientific world, to provide a scientifically broadening educative process at every level so that enlightened decisions on the use and application of scientific knowledge can be made by an informed public.[57]

Seen in its correct perspective the task ahead amounts in reality to a re-making of the over-all exhibition complex. The burden of planning this "re-making" and implementing the plans approved by the Trustees has fallen on the shoulders of Mr Fowler, and the task had only just begun at the time of the Centenary Dinner. It has involved a comprehensive programme for the conversion of vacated art galleries into science galleries with appropriate decor, electrical services and new approaches to displaying exhibits. When this re-organisation is completed, the actual display areas will increase from 21,420 square feet to 34,370 square feet. The Old Drawing School will become the new Education Centre to meet the needs of the fast expanding schools' service. The old Painting School is a large area but its position is considered to be too remote for exhibition purposes and so it will become the new preparation centre with better facilities than the old restricted area provided. The latter was too small and much too inconvenient to enable the staff to produce the best work in it. The Block A store will become a new photographic centre with studio and processing facilities adequate for the continuously growing photographic needs of the display staff. The McArthur Basement will serve in part as a store for large items and the east end will be the site of the Technicians' new machine shop with full facilities for turning, milling, welding and electrical work. An important step towards "humanising" the exhibition galleries for visitors will be the provision of a ladies' lounge to meet primarily the needs of visiting mothers with young children.

When the National Gallery moved to its new premises a new position of Secretary to its Council of Trustees was created. The appointee was Mr William McCall,[58] the officer who previously had been Secretary on a shared time basis to all four trusts and chief executive officer of the Building Trustees. The resulting vacant office of Secretary to the Library Council and the two museum trusts, and again chief executive officer of the Building Trustees, was filled by the appointment of Mr William Leslie Drew,[59] the present occupant of the position.

The National Gallery's removal of its works of art had reached an advanced stage of completion by March 1968 and from then on a start was made on the re-decorating of the vacated galleries. This move to re-paint and re-furnish several galleries had been expedited because of the Institute's need to mount an exhibition conducted by the Industrial Design Council of Australia.[60] The main exhibition was held in the

[57] The Annual Report of the Institute of Applied Science, 1967-68, p. 8.

[58] Mr William McCall, E.D. Permanent officer of the Public Service of Victoria. Secretary to the Board of Trustees of the Museum of Applied Science from 23 April 1959 to 22 Jan. 1961; and Secretary to the Board of Trustees of the Institute of Applied Science from 23 Jan. 1961 to 4 Sept. 1967.

[59] Mr William Leslie Drew. Permanent officer of the Public Service of Victoria. Secretary to the Board of Trustees of the Institute of Applied Science from 20 Oct. 1967 to 2 Feb. 1971, and Secretary to the Board of Trustees of the Science Museum since 3 Jan. 1971.

[60] The Industrial Design Council of Australia was established in 1958 to encourage original Aus-

Murdoch Gallery—now Swinburne Hall—and one entry, a harvester, had to be accommodated out of doors, but near the gallery entrance, because of its size. The exhibition's day of opening and its judging day was 31 May 1968. The exhibition was a success and it attracted large numbers of visitors daily until it closed two weeks later on 15 June 1968. Its highlight occurred on the opening day when H.R.H. the Prince Philip, Duke of Edinburgh, arrived to take part in the final judging[61] of the entries.[62] His Royal Highness was received at the Russell Street entrance by the chairman of the Trustees, Mr F. M. Read, who presented Mr R. A. Hohnen, the Chairman of the Industrial Design Council of Australia and Mr Best Overend who was the Chairman of the Council's Victorian State Committee.

Later, at a luncheon in the Stawell Gallery Prince Philip announced the names of the prize winners. The first prize, the Prince Philip Prize, was awarded to David Shearer Ltd of Mannum in South Australia for their entry—a self-propelled harvester which had been designed by a South Australian engineer, Mr Kenneth Gibson.[63]

Although special exhibitions come and go, the Institute's administration must, like the brook, go on forever. Its re-organisation in new and more spacious accommodation will necessarily be spread over a period extending well beyond the Centenary Celebrations because of its magnitude and its cost. By the end of the centenary year of 1970, much had been accomplished but much remained to be done thereafter. Early in the course of this re-organisation Mr Fowler drew attention to the need to review the names of certain galleries which had been handed over from the National Gallery to his charge. He said that:

> In any event the National Gallery Council of Trustees wished to take with them certain gallery names for their new premises, and duplication as a consequence was felt to be unadvisable. Some of the old gallery names commemorated personalities who were art-oriented and not primarily interested in applied science.

Two proposals for renaming galleries had a special appeal to the Board of Trustees of the Institute of Applied Science. One was to adopt the name of General Sir John Monash,[64] who, as an outsider, played a leading role in the movement which brought about the re-opening of the Industrial and Technological Museum in 1915. The second proposal was to re-name a gallery to commemorate the name of the Hon. George

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tralian design and to foster an appreciation of good design throughout the community. The Council's members are representatives from industry, commerce, governments, designers and educationists. The Council is financed by grants from the Commonwealth and State governments and from private industry.

[61] The panel of judges was: H.R.H. the Prince Philip, Duke of Edinburgh, Sir Robert Blackwood, M.C.E., B.E.E., M.I.E. Aust., Mr. W. R. Bunning, F.R.A.I.A., Mr Ian Fullarton, Mr Adrian Knaap and Mr I. S. Hayward.

[62] For a comment on the judging see *The Age*, 1 June 1968, p. 19; see also *The Sun*, 1 June, 1968, p. 8.

[63] The Annual Report of the Institute of Applied Science, 1967-68, p. 19.

[64] For factual information on Monash's civil and military careers see Warren Perry, "General Sir John Monash: Scholar, Engineer and Soldier", (*Journal and Proceedings of the Australian Jewish Historical Society*, vol. 4 part 6, 1957), pp. 285-306, and Warren Perry, "The Military Life of General Sir John Monash" (*The Victorian Historical Magazine*, vol. 28, no. 1, Dec. 1957), pp. 25-42.

Swinburne who collaborated, as a Trustee, with General Monash in having the Museum re-opened in 1915. He played the role of the "friend at court" for Monash's committee. Mr Fowler said: "The success of the efforts spear-headed by these two great men is now a matter of Institute history, and it is entirely logical that we now have the names 'John Monash Hall' and 'George Swinburne Hall'. They replace the names 'Kent Gallery' and 'Murdoch Gallery' respectively".[65] Today these two names, Monash and Swinburne, are indissolubly linked in the Institute's history just as, in the history of German literature the names of Goethe and Schiller are thought of together.

In his annual report for 1968-69 Mr Fowler drew attention to two accessions of special interest. The first came from the estate of the late Alexander Hope Mackie who was the proprietor of a general engineering firm in Therry Street, Melbourne for many years. Mr Fowler observed that it was "a firm with which the Institute placed occasional machining orders, but never without an element of embarrassment because the Institute was never successful in persuading Mr Mackie to tender an invoice". Over the years Mr Mackie paid many visits to the Institute and he often expressed admiration for its objectives and its achievements. He found joy and relaxation in model-making, and particularly in the making of models of steam locomotives, in his private workshop at the rear of his home at 9 Queen's Road. Mr Mackie died in August 1968 and the Institute was informed that he had bequeathed the entire contents of his private workshop to it. The bequest to the Institute was conservatively valued at $20,000. It included two models of steam locomotives which are tributes to Mr Mackie's skill and patience.[66] Mr Fowler pointed out that:

> The receipt of the equipment came at a time when it was particularly acceptable, coinciding with detailed planning of the Institute's new machine shop in the McArthur basement. When added to the existing equipment we will have a comprehensively equipped machining shop for our very diversified needs.

The other accession was another donation from the Hugh Victor McKay family. Mrs C. N. McKay and her nephew, Mr H. V. McKay III gave the Institute, through the Sunshine Foundation, their collections of documents and other historical records relating to the life and work of Hugh Victor McKay I (1865-1926), the inventor and manufacturer of agricultural machinery. Mr Fowler informed the Board that:

> The new archival material which has been entrusted to the Institute will be added to that which has already been collected. It will be accessible to bona fide research historians who wish to augment the biographical record of Hugh Victor McKay, one of Australia's great sons.

This gift had been preceded by a number of earlier ones from the family. In 1915 Hugh Victor McKay I[67] had presented to the Museum three models of agricultural

[65] The Annual Report of the Institute of Applied Science, 1968-69.

[66] Other items in the bequest included five lathes of various applications, surface grinder, two milling machines, bandsaw, presses, saw bench, a number of precision gauges and electrical test units.

[67] Annual Report of the Institute of Applied Science, 1968-69.

machinery made by his firm, the Sunshine Harvester Works, at Sunshine.[68] After his death in 1926 the company made further important gifts of models of agricultural machinery in 1930,[69] 1938,[70] and 1956.[71] In 1955 the McKay family severed their connections with the company founded by Hugh Victor McKay I;[72] but the family continued their interest in the Institute. The small bark-roofed hut, in which Hugh Victor McKay I made his first harvester in 1884, was offered to the Institute by his son, Mr C. N. McKay (1899-1968) and it was accepted by the Trustees at their meeting on 24 October 1960.[73] Earlier, during the year 1957-58, Mr C. N. McKay also presented to the Institute a scale model of this hut or "farm smithy" and also a large bronze bust of Hugh Victor McKay I by Wallace Anderson. Today this bust can be seen in the foyer of the H. V. McKay Melbourne Planetarium.

The close of the financial year on the 30 June 1969 also marked the close of Mr Read's term of office as Chairman of the Institute.

In relinquishing the office on this occasion Mr Read observed:

> In an earlier age appreciation of the Arts was the most stimulating influence on progress and enlightenment of man and the progress of the nation. Today the comparable task of those who lead the community is to cultivate the thirst for scientific knowledge in the young and to provide the means whereby scientific skills may be acquired later. My fellow Trustees and I firmly believe that the Institute of Applied Science has the capacity to play a most important part in this process.[74]

The Institute's next chairman, Dr J. A. L. Matheson,[75] is a distinguished scholar, engineer and administrator who is also a well-known public figure. He was born at Huddersfield in Yorkshire and came to Australia to become the first occupant of the Chair of Civil Engineering in the University of Melbourne, which he held from 1946 to 1950. Then he returned to England to become Beyer Professor of Engineering in the University of Manchester and he held this appointment from 1950 to 1959. In

[68] These models were a disc cultivator, a disc plough and stump jump plough. See Annual Report of the Trustees, 1915, p. 25.

[69] H. V. McKay Pty. Ltd presented a model of the original stripper harvester which was designed in 1884 by H. V. McKay I. See Annual Report of the Trustees, 1930, p. 39.

[70] H. V. McKay Massey-Harris Pty. Ltd presented, through their Chairman of Directors, Mr D. B. Ferguson, ten quarter scale models of agricultural implements all bearing on the invention and development of stump jump and reversible ploughs. See Annual Report of the Trustees, 1938, p. 82.

[71] Annual Report of the Museum of Applied Science, 1956-57, p. 27.

[72] About 1930 the company, H. V. McKay Pty. Ltd, merged with the Canadian Massey-Harris Company to form H. V. McKay Massey Harris Pty. Ltd. In February 1955 H. V. McKay Massey-Harris Pty. Ltd became a subsidiary of Massey-Harris Ferguson Ltd when all ordinary shares held by the McKay family were sold to the Toronto based company. In 1958 the company in Australia was re-named Massey Ferguson (Australia) Limited). See *Massey-Ferguson Review*, no. 86, Dec. 1965 —Commemorating the Centenary of the birth of Hugh Victor McKay and acknowledging his contribution to farm mechanisation and the world-wide Massey-Ferguson organisation.

[73] Annual Report of the Museum of Applied Science, 1960-61, pp. 7-8.

[74] Annual Report of the Institute of Applied Science, 1968-69.

[75] Dr James Adam Louis Matheson, M.B.E., M.Sc., Ph.D., M.C.E., D.Sc.(Hon.), F.I.C.E., F.I. Struct. E., F.I.E. Aust., F.A.C.E., Trustee from 1963, Chairman of the Institute of Applied Science from 1 July 1969 to 2 Feb. 1971, and President of the Science Museum of Victoria since 3 Feb. 1971.

that year he returned to Australia to become the first Vice-Chancellor of Victoria's second university—Monash University at Clayton. He is also the author of a number of technical papers on structural engineering and of an advanced textbook on hyperstatic structures.[76] It is of course platitudinous to say that the pathway trodden by a Vice-Chancellor is not strewn with roses and a former Vice-Chancellor of the University of Adelaide who also observed the absence of roses, was moved once to say that:[77]

> A vice-chancellor's job is subject to many tensions. If he hopes to be regarded as a jovial figure, beloved by all, he is likely to be disappointed. He must therefore possess some kind of armour against the buffeting he is likely to experience. This armour may be the hide of a rhinoceros with which a kindly nature, foreseeing his fate, may have endowed him. If this be denied him then he must have strong convictions—a faith if you like.

It is not known what kind of armour Dr Matheson wears. But it is known that he is devoted to the University he serves, that he discharges his duties with zeal and industry, and that he seeks what few moments of pleasure and relaxation he can find, as Frederick the Great did long ago, in playing the flute.

[76] J. A. L. Matheson, *Hyperstatic Structures* (Butterworth Scientific Publications, London), vol. I (1959) and vol. 2 (1960).

[77] A. P. Rowe, *If the Gown Fits* (M.U.P., 1960), pp. 185-186.

Chapter 12

Seconded and Honorary Staff

In recent years the Institution had been discharging a more active role than hitherto by the adoption of a new method in exploiting the educational value of its collections. This role is designed to meet the growing demands of primary and secondary schools for visual and printed information on developments in applied science, and its functions are discharged with the assistance of a small staff of Education Officers.

These officers are professional teachers of the Department of Education who are seconded to the Institute of Applied Science to assist the Institute's staff in promoting this educational work. This inter-departmental arrangement is making an important and a continuing contribution to Victoria's educational system. It is making possible, for the first time in the Institute's history, visits of organised parties of school children to the Institute with specific objectives which are related to their school curricula. Education officers conduct these parties of school children through the Institute and assemble them for specific demonstrations, and the scheme is bringing about a wider and better understanding of developments in applied science. In this way the children's imaginations are stirred and their enthusiasms aroused. Little reflection is needed to realise that in this way many potential scientists are being channelled into their future careers and they are being saved, at crucial stages in their educational development, from the evils of indecision. Their studies of illustrations and descriptions in text books and the oral explanations given to them in classes can be supplemented at the Institute by examining there the achievements of science in three dimensions.

The first attempts at an education service were in 1957 when Dr Focken arranged to have the part-time guide lecture services of Mr E. F. Halkyard. This arrangement worked well, but was limited in scope. Then, in 1959, Mr F. A. Doré was appointed in a full-time permanent capacity and the service developed further in an encouraging way. Mr Doré resigned in 1961 and was replaced by Mr D. F. Marshall.

The Institute's present education service with seconded staff began in March 1962 when Mr Leon F. Costermans—a teacher of the Department of Education of Victoria —was attached to the Institute. He made the scheme a success from the outset and he was able to report the following achievements by the end of June 1962:[1]

[1] Annual Report of the Institute of Applied Science, 1961-62, p. 11.

* Total number of children in visiting groups	926
* Number of teachers who accompanied these groups	32
* Number of visiting school groups	18

In addition to these conducted parties the Education Officer attended to many written requests for information for projects and for publications distributed by the Institute. During the following year, 1962-63, ninety-six groups, consisting of 4,011 school children, visited the Institute and these groups were accompanied by 153 teachers.

In that year Mr Fowler, who was the driving force behind the development of this scheme, said that the aims of the education service were twofold. First, to lead children to an awareness of the overall value of the Institute in meeting their immediate and ultimate needs; and second, to relate the Institute's exhibits directly to school courses, and, when practicable, to develop new exhibits in order to improve this relationship progressively. Mr Fowler also pointed out[2] that:

> The school visits to the Institute have now lost their haphazard character. Teachers arrange topics in advance, and parties receive assignment sheets and other literature. In many instances they attend demonstrations as pre-arranged, and to wind up the procedure there are follow-up questionnaires.

An extension of this scheme to provide for adults was undertaken by the Institute's lecturer, Mr D. F. Marshall, whose school services were transferred to Mr Costermans. He inaugurated during the year 1962-63 a regular series of weekly lunch-hour lectures and he selected mainly those subjects which did not lend themselves well to static display. By this means the Institute's display function was supplemented in a useful way. These lectures were conducted in an informal atmosphere and casual visitors were welcome to drop in and remain for whatever spare time they had. Mr Fowler said[3] that: "Mr Marshall's flair for quickly setting up demonstration material, and his wide experience, enabled him to cover an impressive range of topics in a very effective way".

The education service for school children continued to flourish and for the year 1965-66, Mr Fowler was able to report[4] that:

> The education service provided by the Institute has broken all records. One can only describe the increase as explosive. The maintenance of the quality of the service has made very severe demands on the small team of part-time seconded education officers, and very great credit is due to them for their efforts to cope with a difficult situation. The biggest single factor contributing to the increasing demand is undoubtedly the establishment of the Planetarium, but other influences, such as the growing awareness of the Institute's teaching aid potential, are certainly operating. The only-too-obvious observation to be made concerning the service now is that it could be so very much better with a very modest increase of man-power.

[2] Annual Report of the Institute of Applied Science, 1962-63, p. 16.
[3] Ibid, p. 16.
[4] Annual Report of the Institute of Applied Science, 1965-66, p. 18.

Five years after the Education Service had begun in 1961-62 the numbers of those who availed themselves of its services had increased beyond expectations. During the year 1967-68 a total of 794 school groups, made up of 35,838 children, visited the Institute, and these figures clearly indicated a sharply rising demand for this service on the part of schools. Moreover, they show the kind of service that the Institute can provide if it has the necessary staff and equipment. In that same year, 1967-68, the Department of Education provided the Institute with one full-time and four half-time teachers on loan to assist with this work.[5] This increase made possible more diversification in the educational service than the Institute hitherto provided. New sessions were introduced which were concerned with agriculture, biology, economic minerals, space travel,[6] technology and television.

By the year 1970 the Department of Education had increased its teaching staff on duty at the Institute to two full-time (one specialising in the planetarium) and five part-time teachers.[7] Nevertheless, there was at this time an urgent need for a second full-time teacher for the planetarium service.

A feature of the benefits which the Institute's Education Service is providing is their expanding character. They have already extended beyond the function of receiving and conducting parties of visiting school children through the Institute. There is nowadays an increasing inflow of written requests for information on particular school projects from teachers and school children alike, and requests are also growing from public and private bodies and from individual persons for information on particular subjects. These important demands are being met reasonably promptly with current resources in staff. Another current trend is the provision of more educational sessions for visiting groups from primary, as compared with secondary schools than was the case say five years previously. The visits of groups of school children to the Institute have one long term benefit which is often unnoticed because it is not immediately visible. It is an awakening of intellectual interests, which in some instances will persist for the remainder of life, and education, like breathing, Mr Fowler has pointed out, is a continuous process from birth to death.

As in all human activity the Institute has problem areas in this Education Service. The principal ones are staff and space. The use of teachers-in-training who can only devote half their time to their work at the Institute, because they must devote the other half to attendance at courses of study at one or other of Melbourne's universities, sometimes results in their services being required in two different places concurrently. The present Education Centre in the Childers Room is a temporary one pending the conversion of the more spacious old Drawing School of the National Gallery. The Childers Room is effective for its temporary function but it becomes congested when large parties visit it. Its use has not been without advantages during this transitional stage of the Education Centre. It has enabled educational services to be developed

[5] Annual Report of the Institute of Applied Science, 1967-68, p. 15.

[6] Visual material for the sessions dealing with space travel is received from time to time through the courtesy of the National Aeronautics and Space Administration of the U.S.A.

[7] For a staff list as at the 3 Feb. 1971, see Appendix D.

other than the planetarium service[8] which for a while tended to dominate the overall educational activities of the Institute. The new facilities provided by the Childers Room have made possible sessions of a participatory character with the aid of scientific devices which children can operate rather than sessions which obliged them to be passive listeners. The response to this change from schools has been good and since May 1970 the Childers Room has been in use almost daily.

It will be recalled that when the Institute of Applied Science was opened one hundred years ago one of its major functions, until the coming into operation in 1887 of the present day Royal Melbourne Institute of Technology, was to provide technical instruction for apprentices and for other classes of interested people. During the first decade and a half of its existence, the Institute maintained three schools of instruction. These were a School of Chemistry and Mineralogy, a School of Mathematics and Practical Geometry, and a School of Telegraphy.

Today, a century later, the Institute still discharges important educational functions. It should be noted, however, that these functions have undergone many changes during the course of time and they are different today in their aims, being directed to different classes of people in the community than was the case a hundred years ago. Today educational values seem always to be in a state of flux. They have to be continuously appraised, revised and discarded in order to meet the continuously and rapidly changing needs of this modern world of technology and changing ideas in education theory. A not insignificant factor in framing earlier museum education procedures was the desire to control the uncontrolled large groups of children and channel their attention along set lines. This process probably went too far, and the emphasis in 1970 is towards minimising the didactic approach and encouraging participation and exploration, and, above all, making the visit of a child a happy experience.

The employment of a salaried staff adequate in numbers and with the required qualifications has been an objective of successive boards of Trustees, and Directors, particularly since the dissolution of the four-branch trust in 1945. However, there comes a stage in the development of staff establishments when they must be stabilised at a level acceptable for reasons of costs to Parliament. At such a level, and certainly before it is reached, it will always be evident to Trustees and Directors that there remain subjects which no member of the salaried staff is qualified to deal with. The solution to these situations lies in the employment of honorary staff. Most museums are well served by honoraries—this Institute is certainly no exception. Some members of the Institute's honorary staff have been so unstinting and generous with their services that they have merited the title of Honorary Curator or some equivalent.

Outstanding honorary service has been given to the Institute in the area of astronomy, particularly in the administration of the free Observatory demonstrations.

[8] Several Education Officers have devoted much time to learning the operational procedures of the planetarium. They can, as a result thereby conduct school session in it; they have added to the number of persons available to conduct planetarium sessions for school children; and they provide a larger reserve of operators for the Education Officer (Astronomy) to draw on.

This service, which began in 1947 when the Museum took over some of the facilities of the Melbourne Observatory after its closure, has been an outstanding success. For the year ended 30 June 1970 it was recorded that the Observatory was visited by 1,923 persons, entailing 298 demonstrator attendances. The overall total attendance since the service was commenced reached 33,000 by 1970. A team of people is involved, but the contribution of Mr W. G. H. Tregear[9] merits special mention. He has been the Honorary Curator of Astronomy since 1966, a member of the Museum's Observatory Council and that Council's liaison officer with the Astronomical Society of Victoria since 1959. His service with the Institute began in 1952 when he qualified as a telescope demonstrator, and in 1954 he accepted the task of training and examining potential demonstrators in astronomy. At the same time he accepted the arduous office of Convenor of Demonstrations which he still occupies in 1970. The duties of this office include the maintenance of duty rosters for a panel of about forty demonstrators who render a continuous service to the public.

Major E. J. Millett, Honorary Curator of Arms, has a long record of honorary service with the Institute. This began informally in 1939 when he assisted Mr E. H. Penrose with identification problems and other details required in the compilation of the Catalogue of Firearms. He has continued to give active assistance on request over the subsequent years and his acceptance of the office of Honorary Curator of Arms in December 1953 was in effect the formal recognition of a de facto situation. The growth and quality of the arms collection have been greatly aided by the efforts of Major Millett. His advice has been invaluable; he has often given assistance in the procurement of exhibits and he has also made donations of exhibits to add to the Institute's arms collections.

Mr Joseph Lowy accepted the office of Honorary Curator of Horology in December 1953. He is famed as one of Australia's leading experts in watches and clocks, and has freely given his time and advice to the Director over the years. He has been a protagonist of the Institute's interests, never losing an opportunity to lend his name to its causes, particularly through his flair for writing articles for the press and letters to editors of newspapers. He has also made many gifts of valuable timepieces to the Institute and has encouraged others to do likewise.

Mr Rodney Serle has a similar record of freely-given service. He was appointed Honorary Curator of Shipping (Sail) in April 1967, but his active association with the Museum had begun a dozen or more years earlier. Mr Serle has a wide knowledge of the technical details of sailing ships. He never fails to answer a call for advice on prospective acquisitions, and for replies to technical correspondence in his field. In this service he succeeded the late David M. Little who served the Museum well as shipping adviser for a very long time—spanning a period of more than thirty years from the later Walcott era until 1963. In retrospect, it is a matter of regret that his association was allowed to remain informal. Because he was not officially appointed to an authorised honorary position his services have not been officially recorded.

[9] William George Herbert Tregear, Dip.C.E., M.I.E. Aust., F.R.A.S., F.B.I.S., a civil engineer on the professional establishment of the Victorian Railways.

Also in the shipping field, but roughly confined to steam and motor vessels, the Institute receives the services of Mr Cecil E. Daw. He was appointed Honorary Curator of Shipping (Steam and Motor) in April 1967 and he has served the Institute well indeed in the course of his occupancy of this honorary office. His initiative in locating and acquiring for the Institute the fine model of the historic M.V. *Duntroon* in 1965 was an outstanding achievement, and he continues to serve the Museum with the greatest enthusiasm.

Much could be said about the honorary committees which have had such an impact on the Museum's activities. Reference has already been made to the successful campaign of the committee of scientific societies headed by John Monash in 1912. In more limited fields the Railways and Planetarium Committees have rendered valuable aid to the Institute's development. The Observatory Council has also lightened the burdens of the permanent staff in many ways by its handling of the recurrent problems of the Observatory and by the maintenance of its services to the public.

Chapter 13

The Centenary and Thereafter

The span of the history of the Institute of Applied Science of Victoria extended to a century in 1970; it covers the last thirty years of the nineteenth century and the first seventy years of the twentieth century. The surprising character of the events of this span of time surpass in importance any equal period of earlier times.

People and material are more mobile in 1970 than in 1870 because of radical changes in methods of transport. The internal combustion engine has revolutionised land transport and it has made air transport possible. The motor car and the aeroplane have made bewildering impacts on industry and they have affected profoundly the social lives not only of the people of Australia but of the whole world. They have affected not only the layout of towns; they have also accelerated the decay of many and hastened the development of others. They have stimulated demands for oil and for electrical, glass, plastics and rubber products. Few consumers of petrol today who reflect on the present size and capacity of this highly organised industry, can recall that before the War of 1914-18 petrol was sold largely by bicycle repairers and ironmongers in four-gallon tins. The motor industry now consumes vast quantities of steel and it is probably the largest single user of machine tools in Australia. It provides employment too in a wide variety of occupations, and so any major changes in technology or wide fluctuations in demands for cars and aircraft have wide-reaching effects on the stability of Australia's economy and in the character of its industrial organisation. These vast changes are reflected in the range and variety of the Institute's displays.

The past hundred years has also seen the gradual disappearance of the sailing ship from the high seas and its replacement by mechanically propelled steamships. The Institute's shipping display shows that today even the steamship has been largely replaced by the motor ship. Enormous changes have occurred in methods and capabilities of artificial lighting since the Institute was first illuminated by gas lights one hundred years ago. Gigantic changes have occurred in the organisation and methods of primary, secondary and tertiary industries and in the volume of their outputs. Machines on display in the Institute indicate that much of the physical labour formerly performed manually by workers is done nowadays mechanically.

Not only has technical education changed its methods and its objectives since

James Cosmo Newbery organised the Institute one hundred years ago to provide courses for those who wanted them; it has also gained a greater importance and a higher status. No longer is technical education considered to be inferior to the classical system of education which enjoyed the highest status until the weight of evidence exposed its aridity, worthlessness, and retarding influence[1] in an age of rapid scientific and industrial development in which the Institute has played a part in helping to promote in Victoria. Enormous developments have occurred in the field of communication. When the Institute opened in 1870 nobody foresaw the coming of wireless communications, the cinema or television entertainment; and it was not until a decade later that the telephone was first used in Melbourne.[2] The year 1870 also coincided with the glimmerings of the new applied biology. Louis Pasteur the French chemist was turning his attention to the mysteries of fermentation. Gregor Mendel had published his findings on genetics only four years before and the time fuse of their eventual impact was still smouldering. Orthodoxy was already suffering the first devastating assault of the Darwin-Wallace publications. The endeavours of Morton, Simpson and Snow to establish anaesthesia were bearing their early fruits, and Paul Ehrlich, a young man of eighteen was turning his attention to a career in science which was to promise the benefits of chemotherapy to a suffering world. The efforts of these men, and of contemporaries and successors too numerous to mention, have given us our unprecedented century of progress in the fields of plant and animal breeding, medical diagnostics and therapy, and numerous other priceless legacies to humanity.

The Institute's celebrations in 1970 to commemorate its opening one hundred years earlier were preceded by very considerable activity in making the necessary physical and administrative preparations. New display areas had to be occupied and old ones evacuated; empty halls had to be re-decorated and refitted before exhibitions could be mounted in them; some exhibits had to be restored before they could be displayed; and some had to be moved from one location to another. These changes involved much planning, the fixing of priorities and the meeting of deadlines.

Mr Fowler, ably supported by his staff, directed and controlled all this work. He was responsible for meeting all deadlines and for keeping the Trustees regularly informed of progress. Tasks of this kind usually have occasional moments of satisfaction interspersed with long periods of uncertainty and anxiety about timetables and priorities.

[1] In discussing the English public school system as it was towards the end of the nineteenth century, H. G. Wells said: "People had been teaching the classics for three centuries; the routine had become so mechanical that it was done best by men who were intellectually and morally half asleep. It led to nothing; except in very exceptional cases it did not even lead to a competent use of either the Latin or Greek languages; it involved no intelligent realisation of history, it detached the idea of philosophy from current life, and it produced the dreariest artistic Philistinism, but there was a universal persuasion that in some mystical way it educated. The methods of teaching science, on the other hand, were still in the experimental stage, and had still to convince the world that even at the lowest levels of failure they constituted a highly beneficent discipline". See H. G. Wells, *The Story of a Great Schoolmaster* (Chatto and Windus, London, 1924), pp. 30-1.

[2] The Centenary Celebrations Council, *Victoria: The First Century* (Robertson & Mullens, Melbourne), 1934, p. 288.

Mr J. M. Turner,[3] a member of the Board of Trustees, acted as an adviser in public relations during the preparation, launching and conducting of the celebrations. He gave much useful professional guidance to the Director and his staff on ways and means for achieving the most effective liaison with representatives of the press, radio and television.

The government of Victoria invited the Trustees to participate in the State's Captain James Cook Bi-Centenary Celebrations which coincided with the Institute's own centenary celebrations. The Trustees decided, therefore, to set up displays which would concentrate on the scientific objectives of Cook's first voyage (1768-71). The first display unit to be built was an explanatory representation of the transit of Venus, the observation of which was the prime purpose of Cook's voyage. The display included a representation of the sun across which a small black sphere passed to represent the appearance of Venus during transit. Two separate peep-hole viewing points provided the line of site from Vardo and from Tahiti respectively. The parallax difference in the two transit paths was demonstrated, and the mathematical significance of this difference explained. Included in the display was a coloured picture of the observatory set up by the Cook party at Fort Venus in Tahiti as well as supporting illustrations and objects.

The second display included a selection of botanical specimens which Sir Joseph Banks had collected during Cook's exploration of Australia's eastern coast, and which were lent for the occasion by the National Herbarium of Victoria. This display unit also included the Norman Lindsay model of the *Endeavour*, and the original painting of the vessel by the Victorian artist, Richard Linton. Reproductions of this painting were offered for sale. The Institute's own centenary celebrations also provided for an astronomical display.

Developments in road transport were another feature of the Centenary exhibition. The Institute's collection in the Verdon Hall included, besides a Cobb & Co. coach, motor cars, bicycles and motor cycles, and related exhibits, which explained and illustrated stages in the development of road transport. Six new special exhibits were set up for the display—four motor cars, one bicycle and one motor cycle. The first exhibit, a Gräf und Stift motor car, was made in Vienna; it was imported into Australia probably in 1925 and it was presented to the Institute in 1938 by Mrs Loveridge of Anglesea. The second exhibit, a Fiat 501 tourer, was an example of a mass-produced car of the year 1925.

The third exhibit was a 1948 model of the Holden car.[4] The first mass-produced car in Australia came off the production line of General Motors-Holdens at Fisherman's Bend on 29 November 1948. Prior to the company's introduction of their method of total production in Australia, motor cars were imported either complete

[3] John Morton Turner, M.B.E., E.D. Appointed trustee, 30 Sept. 1969. Joined Bank of New South Wales, 1930; Public Relation's Manager for the Bank, 1951-69, and attached to Chief Manager's staff since 1960. Served with A.I.F. during the War of 1939-45. Life member and Public Relations Adviser of R.S.L. Member of the Board of National Theatre Ltd.

[4] For the royal visit to the Institute on the 8 April 1970, General Motors-Holdens Pty. Ltd exchanged this car, temporarily, for the first Holden car to come off the line, on 29th November 1948.

or as chassis to be fitted with bodies made in Australia.[5] The fourth exhibit, a Hartnett car, was lent by Sir Laurence Hartnett who had it restored, at his own expense, to showroom finish for the centenary exhibition. It was designed, in collaboration with him, by the Frenchman, Jean Grégoire, and it is an example of the second car to be mass-produced in Australia. It embodied the "small car concept", and horizontally opposed twin cylinders and air cooling were a few of this car's features. The cast aluminium components were novel features in the car manufacturing industry.[6]

The fifth exhibit was of a different and less powerful kind. It was a "Master Sports" racing bicycle which was a gift to the Institute from Mr Victor G. Browne who is today the holder of an impressive list of cycling records. The sixth exhibit was of a different kind again. It was an early type of motor cycle known as a "Liberty" and it was built by the Acme Motor Cycle Co. of Melbourne in 1916. It has a single cylinder four-stroke engine of $1\frac{3}{4}$ horse power and the final transmission was by means of a rubber belt. Unconnected with these exhibits, there was a display of methods of artificial illumination in the eastern bay of the Verdon Hall.

An important addition to the maritime display in the Buvelot Hall for the Centenary celebrations was a model of the cargo vessel, *City of Winchester*. This excellent model of a ship of 13,340 tons, which was built at Dumbarton in Scotland and launched in October 1952, was presented to the Institute by Ellerman and Bucknall (Australia) Pty. Ltd. of Sydney.[7]

The McArthur Hall was one of the main areas of the Centenary exhibition and its principal exhibits were aircraft. The Duigan aeroplane—the first Australian-made machine to fly successfully—was there. The wings and tailplane had been re-covered with a new fabric and the engine was completely overhauled and restored to its original appearance in the Institute's workshop.[8] The aeroplane is now mounted on a pedestal just high enough to be clear of visitors who come to inspect it but low enough for them to see it clearly.

Bringing the Institute's Wirraway aeroplane into the McArthur Hall from storage at Sunshine was an exacting task. The main fuselage and the engine section caused some anxiety when it was being lifted into the McArthur Hall by a complicated two-crane manoeuvre, but it was completed without mishap.

An historic series of aeroplane engines was also displayed in the McArthur Hall to illustrate developments in internal combustion engineering for aircraft. Two radial air-cooled engines were sectioned and mounted for display. One was a single-row radial type, first manufactured in 1926 by Pratt and Whitney in the U.S.A. This type of engine was used in the Wirraway. The other was a twin-row radial engine of the type used in the Beaufort and Dakota and first manufactured in 1933 by Pratt and

[5] Frank S. Daley, "The Holden Saga". (*Victorian Historical Magazine*, vol. 38, no. 2, May 1967), pp. 42-59.

[6] L. J. Hartnett, *Big Wheels and Little Wheels* (Lansdowne Press, Melbourne, 1964), chapter 29.

[7] The Annual Report of the Institute of Applied Science, 1969-70.

[8] Mr Terence Duigan, a nephew of the late J. R. Duigan, supplied the Institute with photographs to provide information and guidance to the staff in the work of restoring the aeroplane as closely as possible to its original condition.

Whitney. The twin-row type was probably the most widely used in civil aircraft until the introduction of the jet engine. Two other aircraft engines of special interest were also on display. One was a Benz water-cooled vertical engine of a type used during the War of 1914-18 by the German Air Force. The other was an air-cooled V-type engine which was designed at the Royal Aircraft Factory at Farnborough and first produced in 1914.

One engine of special historical interest was the Rolls Royce Merlin. It was developed from the Rolls Royce 'R' racing engine—the type used in the Supermarine SB-6 seaplane which won the Schneider Cup in 1929 and again in 1931—and it was first produced in 1936. The Merlin was the only engine used in the fighter aircraft which defeated the German Air Force in the Battle for Britain. It was used in the Spitfire and Hurricane fighters, in the Lancaster and Wellington bombers, and in the Mosquito fighter-bomber. The Merlin has come to be regarded, because of its performance, as one of the most famous piston engines ever produced for aircraft.[9] It was also installed in motor torpedo boats of the Royal Navy.

The agricultural display in the George Swinburne Hall was another feature of the Centenary Celebrations. One exhibit there of special interest was a restored Hornsby-Akroyd oil engine which had been manufactured in the 1890's. Its inventor, Herbert Akroyd Stuart, a Yorkshire engineer who subsequently migrated to Australia,[10] began experimental work with oil engines in 1886. This work culminated in his production in 1890 of a successful oil-burning engine. Its novel feature was its automatic system of ignition of oil vapour by hot compressed air. It dispensed with the ordinary methods of igniting the charge by a flame or an electric spark. Instead oil was injected into a red-hot vaporiser where it was converted into vapour and ignited by compression. The invention was developed commercially by Richard Hornsby & Sons of Grantham in Lincolnshire after this firm had acquired the sole rights to manufacture and develop the engine in June 1891. Henceforth, it was known as the Hornsby-Akroyd safety oil engine.[11] It was later sold on the Australian market.[12] The invention of the system of compression ignition is often attributed to Dr Rudolf Diesel (1858-1913) of Germany. But Dr Diesel worked independently; his engine came on to the market later than the Hornsby-Akroyd oil engine, and it differed from the Akroyd Stuart's oil engine in that by compression alone the charge was brought to a temperature sufficient to bring about ignition of the mixture.[13]

An H. V. McKay stripper-harvester, 1906 model, in the George Swinburne Hall was another important piece of agricultural machinery which was restored for the

[9] The single and twin row Pratt and Whitney and the Merlin engines were donated by the Department of the Air in 1946 (see Annual Report of the Trustees of the National Museums of Victoria, 1945-46). They were brought out of storage and sectioned for the Centenary display.

[10] Herbert Akroyd Stuart, engineer. Born 28 Jan. 1864 in Yorkshire. Died 19 Feb. 1927 at Claremont, Western Australia.

[11] For further information see William Robinson, *Heavy-Oil Engines of Akroyd Type* (Blackie & Son Ltd, London, 1931).

[12] *The Australasian Ironmonger*, vol. 8, no. 4, 1 April 1893, p. 117.

[13] J. G. Crowther, *Discoveries and Inventions of the Twentieth Century* (Routledge and Keegan Paul, London, fifth edition, 1955), p. 222.

Institute's Centenary exhibition. This machine combined the two operations of harvesting crops of wheat and the threshing of the grain from the heads of the stalks. It was presented to the Institution in May 1965 by Mr J. P. Polland of Moyston in Victoria. The work of restoration was carried out by Massey Ferguson (Australia) Ltd at Sunshine in Victoria. The machine as a whole had to be given a complete overhaul and some small parts in it were replaced because of deterioration and its re-painting brought the machine back to its original appearance. It illustrates an important early phase in the development of Australia's agricultural machinery.

Other related agricultural displays in the George Swinburne Hall included one on the evolution of wheat harvesting machinery from the sickle to the modern header-harvester. Scale models of a stump-jump plough, early cream separators and a miscellaneous collection of agricultural implements were also displayed.

There was also a sugar display. The sugar industry, one of Australia's oldest and most important, is usually associated with the name Colonial Sugar Refining Co. Ltd. This company had its origins in the Colonial Sugar Refining Co., a partnership of unlimited liability which was formed in Sydney on 1 January 1855.[14] A comprehensive display of features of the industry in Australia was presented by the company to the Institute. These features covered farming, milling and refining and also the research involved in the industry's development. The display formed part of the centenary exhibition and was set up in the George Swinburne Hall.

A special feature of the Institute's Centenary celebrations was a competition for model-makers which was open to three different classes of competitors. A cash prize was awarded to each of the sections and the competition was restricted to amateur model-makers. No entrance fee was charged. The "Junior Section" was opened to those under the age of eighteen years as at 8 September 1970, and the prize was $100.00; the "Apprentice Section" was open to apprentices and the prize was $250.00; and the "Open Section" had no age qualification for entrants and the prize was $500.00. Entrants were allowed considerable latitude in the selection of models to enter, provided the model fell within the field of applied science and was three-dimensional. Models which could be made up from commercially-supplied kits of component parts were not acceptable. Factors which were taken into account in judging were: appropriateness of choice, judged on the basis of educational value and potential general interest; accuracy of scale throughout; perfection of finish; and complexity and scope.[15] The prize winners were announced at the Centenary Dinner.

To commemorate the centenary of its opening on 8 September 1870, the Institute began its six months' celebrations with a late afternoon cocktail party on Tuesday, 7 April 1970, which was attended by about 350 guests.

The Chairman of the Trustees, Dr J. A. L. Matheson, welcomed the guests. The next speaker was the Chief Secretary, the Hon. Sir Arthur Rylah, who referred to the

[14] A. G. Lowndes (ed.), *South Pacific Enterprise: The Colonial Sugar Refining Company Limited* (Angus & Robertson, Sydney, 1956), p. 13.

[15] The numbers of entries judged were as follows: six in the Junior Section, three in the Apprentice Section, and sixteen in the Open Section.

wisdom and vision of the founders of the Institute, its one hundred years of service to the public and the importance of its role in the world of tomorrow. He ended his address by declaring open the Institute's centenary celebrations.

The function was held in the interesting and unusual setting of the McArthur Hall where the theme of the display was a century of aviation, and special prominence was given to Australia's achievements in this period. The restored Duigan aeroplane was displayed just above the heads of the guests and nearby could be seen the Institute's Wirraway.

A royal visit to the Institute took place the following day. At 11 a.m. on Wednesday, 8 April 1970, Her Majesty Queen Elizabeth II and His Royal Highness The Prince Philip, Duke of Edinburgh, accompanied by their Royal Highnesses Charles, Prince of Wales and Princess Anne, were received by the Chairman and Mrs Matheson and the Director, Mr Fowler, on alighting from their car at the Institute's Swanston Street entrance. The royal party and their hosts then proceeded through the forecourt, densely packed with members of the public, and through the foyer of the Institute into the John Monash Hall where they were introduced to the Trustees and their wives and to senior members of the staff. After these formalities, the royal party inspected the exhibits in that Hall which were associated with the Institute's Cook bi-centenary display, with the history of gold mining in Victoria and with the manufacture of iron and steel. After an inspection of the exhibits in the Lower Rotunda, which displayed economic minerals and featured aspects of mining and metallurgy, the royal party moved into the Verdon Hall to see the display of vehicles featuring aspects of the development of road transport. From there they proceeded to the Buvelot Hall where they showed great interest in the display of models of naval and mercantile ships. After leaving the South Rotunda in which they inspected exhibits illustrating a century of progress in selected fields of applied science, including the history of telegraphic and telephonic communications and a prominently displayed statement of James Harrison's contribution to refrigeration,[16] the royal party went to the McArthur Hall to see the aeronautical display. From there they went to the George Swinburne Hall to inspect the display featuring developments in agriculture and biology.

After the completion of this inspection the Queen and other members of the royal party signed the Institute's visitor's book. This concluded the royal visit; its duration was thirty minutes; and the royal party departed by way of the Institute's Russell Street entrance.

The Centenary Dinner took place on Friday evening, 11 September, in the presence

[16] James Harrison (1816-93), journalist of Geelong and Melbourne, studied the making of ice by the evaporation of ether. At Rodney Point on the Barwon River he built Australia's first ice works—probably in 1851. In March 1856 and in September 1857 he patented refrigerating processes in England.

In 1873 he exhibited in Melbourne his machinery for freezing to demonstrate that beef, fish, mutton and poultry could be preserved by refrigeration for long periods. See Percival Serle, *Dictionary of Australian Biography* (Angus & Robertson, Sydney, 1949), vol. 1, pp. 406-7. See also Charles Tomlinson (editor), *Cyclopaedia of Useful Arts* (Virtue & Co., London, 1866), vol. 3, pp. 410 ff.

of His Excellency the Governor of Victoria, Major-General Sir Rohan Delacombe. The Chairman of the Trustees, Dr J. A. L. Matheson, presided.

The guests included the Minister for Health, the Hon. J. F. Rossiter, M.L.A. who represented the government of Victoria. The masculinity of the gathering was not one hundred per cent, as in the case of the Lord Mayor of Melbourne's Annual Dinner. As well as the ladies of the staff, Dame Elisabeth Murdoch, a Trustee of the National Gallery of Victoria and Mrs C. N. McKay, a daughter-in-law of the late H. V. McKay of Sunshine, were present.

Early in the proceedings Dr Matheson called on Sir Laurence Hartnett, the Institute's senior Trustee and a past Chairman of the Trustees, to propose the loyal toast.

Dr Matheson, in his address of welcome, said in one part:

> The organisation, whose guests you are tonight, is at present entitled "The Institute of Applied Science of Victoria" and the history to which I referred earlier explains how this name came about.
>
> On the whole I think the idea really was that, because the organisation was spreading its wings and taking responsibility not only for having a science museum but also running a radiocarbon-dating laboratory, looking after the astronomical instruments down at the Domain, and operating a planetarium, it should have a name that was more complimentary than just Museum.
>
> I do not know whether this has proved really to be a successful move because the fact is that we get letters that should be addressed to the Royal Melbourne Institute of Technology. I believe it is fair to say too that our work is not sufficiently known in the city and throughout the State as it should be, simply because of the not very clear title that we at present enjoy. We have, therefore, petitioned the Government to change our name and I understand that a Bill will be presented at the next session of Parliament which will change our name to "The Science Museum of Victoria". I hope that Parliament will pass this Bill because under that title the work we are trying to do should be better understood.[17]

In his address in reply to that of the Chairman of the Trustees, the Hon. J. F. Rossiter compared scientific progress during the past hundred years with that of the previous two thousand years. The comparison showed how gigantic has been the scientific and industrial progress since the Institute of Applied Science first opened one hundred years ago. Today foods must be prepared for sale in accordance with health standards prescribed by law. But the Minister said that less than a hundred years ago, in order to give them an attractive appearance to potential customers, foods were (in ignorance) impregnated with colouring compounds which were cumulative poisons, and he pointed out that as far back as 1877 the Institute, then under the management of James Cosmo Newbery, who was an analytical chemist, undertook field surveys and analyses and published results which showed the impure and poisonous character of some food preparations then on the market.[18]

[17] The Science Museum of Victoria Act 1970 was assented to on 22 Dec. 1970. This Act No. 8070 came into force by proclamation on the 3 Feb. 1971; and the first meeting of the new Council of Trustees took place on the 4 Feb. 1971.

[18] Industrial and Technological Museum, Melbourne. *Laboratory Notes and Museum Record*, No. 1 January 1878.

As if to typify the enormous advances in science and technology that had been made during the last hundred years of its existence the Institute, in conjunction with the National Museum, had on display a special exhibition featuring one of the first rocks brought back to earth from the moon by the crew of the Apollo 11 space vehicle. This exhibition, opened on 9 September by Professor J. F. Lovering, Professor of Geology at Melbourne University, was inspected by the Governor and other guests during a special interval for this purpose at the dinner.

The last official business of the dinner was of a special and pleasing nature to all present. The Chairman of the Trustees called on another trustee, His Honour Judge Leckie,[19] to announce the names of the winners in the various sections of the Institute's Centenary Model-Making Competition. When Judge Leckie rose to perform this duty he seemed, figuratively speaking, to link hands across the chasm of a century with that other trustee from the County Court Bench, His Honour Judge Bindon. Judge Leckie announced the winner in each of the three sections:

* In the *Junior Section*, the $100.00 was awarded to Master Robert Sherlock of Glen Waverley, aged 11 years, for a model of H.M.A.S. *Arunta*.
* In the *Apprentice Section*, the prize of $250.00 was awarded to Mr Alan John McArthur of Mornington for a 1/3 scale model of an Elliott Milmor turret milling machine. Mr McArthur was a final year apprentice fitter and turner.
* In the *Open Section* the prize of $500.00 was awarded to Mr Jeffrey Mather for a 1/5 scale model of an SS100 Brough Superior motor cycle. Mr Mather was a sheetmetal worker and he had spent three years of his leisure time in making this model.

Each winner was presented to His Excellency the Governor who handed him his prize in the form of a cheque.

The course of the Centenary Dinner then moved to a close. After His Excellency the Governor withdrew, it quickly broke up and the guests and their hosts dispersed. Another hundred years must pass before a similar function can be held again.

The changes which the Museum has witnessed during the past century are now facts of history. Nothing can alter them and they indicate clearly, to all who read, that in the year 1970, scientific, industrial and social conditions have changed radically from those that prevailed when the Museum first opened in 1870. Likewise during this same period radical changes have occurred in the intellectual and emotional climate. Many of the opinions which influenced developments in science and consequent changes in industry and fashioned social conditions in 1870 have, by 1970, like old soldiers, faded away. Most of them, at least, are not relevant to the world in which we live today. The long conflict between religion and science has now been reduced to a rearguard action. The theological dictator is out of fashion. The world has to contend with a new kind who has arisen in his stead. He is variously called a fashion

[19] His Honour Judge Roland John Leckie, B.A., LL.B., Judge of the County Court of Victoria since 1965. Born 30 Dec. 1917, Hawthorn, Victoria. Trustee of the Institute of Applied Science since 17 Dec. 1968.

dictator, a trend-setter or a hidden persuader. Whatever label he bears his purpose is to stimulate industrial output by creating artificial demands for products, which may include motor vehicles, farm machinery, refrigerators, detergents and washing machines. After a relatively short span of time some of these products disappear from the market. They disappear with the finality of yesterday's newspapers and the Museum must decide, in its unceasing task of keeping the balance between the old and the new and the familiar and the novel, whether it should display specimens or models of them or not, as links in the chain of industrial development.

Today the Museum stands at the beginning of the second century of its existence. To forecast its development during the next hundred years is obviously an impossible task. Nevertheless, if the Museum is to maintain its progress it cannot avoid looking forward at least to the horizon to try to determine the kind of image which the past and the present will project on to the screen of its future. But this must be done in ways that do not outrage probability because the promotion of scientific fiction is not a task for a museum of science.

In future, in common with other museums, the Museum will have to be active in its attempts to interest the public in its collections. But it will fail in this attempt unless it gives close and continuous attention to the development of its staff, both in numbers and in training. It can reasonably be assumed that the Museum's role in future will not be fixed and unchanging; it will change in harmony with other changes in the community which it serves. In the same way members of the staff will be required to re-adapt their professional, technical and administrative training and experience to fit them to cope effectively with the ever-changing conditions of the modern world.

It was once accepted procedure in museum administration to concentrate mainly on building up, conserving, and displaying collections in what may be described as a "take it or leave it" fashion as far as the public was concerned. But, already other methods have been adopted. In future, museums of science will probably need to be more active in the performance of their roles, and in the adoption of new and better methods they may even have to resort at times to a legitimate element of showmanship. Members of the public—attracted perhaps in the first instance to a museum by a special short-term exhibition—may suddenly find that their interests in the museum have been widened by its provision of new and useful adjuncts such as more instructive techniques of display, regular lectures on scientific and industrial subjects which are related to their daily work, quick and efficient services of special libraries, the screening of films in projection rooms and the provision of catering services for light meals for visitors in aesthetically pleasing surroundings.

In these ways a museum loses its static conditions and its monotonous and unchanging atmosphere. It becomes a place where things are continuously happening and so its attractiveness grows and its appeal to visitors widens; it begins to function in new and more effective ways and it becomes an educational centre with a new importance. However, not all view with favour the passing of the older static conditions. Some believe a museum should not be a place of activity but a place for contemplation. This problem of change of activity places the director of a museum in a

dilemma for it has been pointed out with some emphasis by a commentator on art museums that:

> The lover of a collection wants to know his way about, he wants to treat it as his own, as a place where he can go when he has a few minutes to spare for contemplation, to look at a favourite painting or vase which means much to him. Sometimes he may want to show 'his' little bronze statuette to a friend, sometimes he wants simply to refresh his memory. What a disappointment awaits him if he finds the room closed for re-arrangement, or open, but so changed, that he cannot find what he has gone to look for. It has been sent to the provinces, or become the victim of some thinning-out process, it was of a period which pundits now call decadent, it is gone! Alas, this is more likely to happen in an active museum than in a stagnant collection. In such moments the lover of art begins to wonder, no doubt unjustly, whether all this change was really necessary.[20]

Is this equally valid for the science museums? A decision must be made.

The future museum should also provide progressive commercial services. Services already started but worthy of intensification include the sale of wide varieties of books and pamphlets on particular subjects concerned with scientific developments and with industrial products of applied science, and the sale of photographic reproductions of exhibits. Continuous observation, reflection and planning might also enable the museum of tomorrow to widen its educational role and to fulfil it in new and better ways. A museum's position among educational institutions is a special one because it uses visual and three-dimensional methods of instruction. F. S. Wallis said: "The basis of the craft of a museum curator is that he enables people actually to see the object rather than to read or hear descriptive phrases concerning it. An object in a museum, accompanied by well-chosen, related material and provided with carefully written labels, is a powerful though silent source of instruction".[21] Two points to grasp here, however, are that changes do not occur fortuitously, and out of nothing, nothing can be created.

A museum must have sufficient resources in money, staff, space and materials at its disposal to enable it to change its role, when necessary, to meet new demands which the public make on it. Museums should be able to respond more quickly in the future than in the past to changes in contemporary ideas, tastes, attitudes of mind and interests, and in so doing they should give less attention to collections that have long ceased to have the same interest for the public today as in earlier times. The interests of the public in science are subject to change and there is no reason to doubt that this trend will continue. By 1970 there was clear evidence of a concentration of interest in particular areas of scientific knowledge, including facets of biology, engineering, medicine and physics and especially those branches of physics concerned with astronomy and atomic energy. These areas of knowledge are undoubtedly more attractive than systematically described (but often uninspiringly displayed) series of

[20] E. H. Gombrich, "Should a Museum be Active". *Museum.* Quarterly review published by UNESCO, vol. 21, no. 1, 1968, p. 81.

[21] F. S. Wallis, "The Museum as an Aid to popular Science" (*Endeavour*, vol. 5, no. 20, Oct. 1946), pp. 149-150.

dried botanical specimens and collections of economic minerals. Nevertheless, these changes must be viewed with caution by directors of museums. From a museum's point of view the public is made up of a number of widely different classes whose members visit museums for many and widely different reasons. In discussing this problem F. S. Wallis said:

> Firstly, there are the 'umbrella' folk who enter to escape a passing shower, though even in that transient state they should be catered for by some arresting exhibit; secondly, intelligent and interested laymen, members of local societies and students who wish to know more about their own particular branch of knowledge; and thirdly, those who are capable and desirous of conducting research in their own well-defined fields. In any discussion on the relationship of science and the museum, these three types of individual should be kept in mind.

The future will probably see a growing conflict in museum administration between the demands of centralisation and decentralisation. The museum's new and important role as a distributor means that in future it will probably have to discharge its functions over a wider field, geographically, than it has during the past century. Hitherto these functions have usually been confined to one central place. Henceforth decentralisation will probably become a trend. The Science Museum in London has already set an example in this respect. It has been said of this Museum that:

> People in the remoter parts of the British Isles are poorly served with museums as far as science and technology are concerned, and visits to London may be rare. With such areas in mind, the museum has in recent years developed a circulation department to create circulating science exhibitions. Self contained exhibitions mounted on eight light panels can be transported in a medium-sized road vehicle or a standard railway container. They are shown in museums, halls, libraries or art galleries. All that is required is about 600 square feet of exhibition space and electric power outlets of normal rating. So far such exhibitions have been circulated, with very great success.[22]

The museum of tomorrow will probably become more and more the centre of an elaborate network with a wide geographical spread and so it must be able to make loans to short term exhibitions in more remote suburban and country centres and, in general, to discharge its functions in ways that not only are, but also seem to be, for the benefit of the people as a whole. In short it will have to try in future to bring the museum's collections to the people and to insist less than in former times on the people coming to the museum's central repository. In doing this, however, each museum of science should strive to preserve its own identity, its own traditions and its own reputation; it should guard against tendencies to become merely an anonymous or little known distributing agency in a large state-wide administrative machine for bringing the benefits of museums of science to people who cannot or will not go to them in capital cities.

[22] L. A. West, "The Science Museum, London" (*Museum.* Quarterly review published by UNESCO. vol. 20, 1967), p. 190.

Appendices

(A) CHRONOLOGY OF EVENTS

1853 On 19 July, the Governor-in-Council appointed five Trustees to administer the Melbourne Public Library. The Council of the Science Museum of Victoria can be traced to this body.

1866 The first Intercolonial Exhibition in Victoria was opened on 24 October in special buildings erected in the Melbourne Public Library grounds and it closed on 23 February 1867.

1867 The Commissioners of the Intercolonial Exhibition were appointed a provisional committee on 24 June "to receive and take charge of any contributions or exhibits which may be presented for the proposed Museum of Industry and Art". The Hon. S. H. Bindon and Professor McCoy were members.

1869 The Technological Commission of Victoria was appointed on 6 January, under the chairmanship of the Hon. S. H. Bindon, M.L.A., "to promote by lectures and otherwise technological instruction among the working classes of Victoria". The Commission's report of 17 February stated that: "We believe that an institution of this sort—a Technological and Industrial Museum—is essential." In April the McCulloch Government appointed the Hon. S. H. Bindon to the Bench as a Judge of the County Court of Victoria.

1870 On 1 February, the Governor-in-Council appointed eighteen Trustees, to administer the Public Library, Museums and National Gallery of Victoria.
This Board held its first meeting on 7 February. Later Sir Redmond Barry was elected President: five committees were appointed, one of which was the Committee of the Industrial and Technological Museum.
At the second meeting of the Committee of the Industrial and Technological Museum, on 24 March, the Hon. S. H. Bindon was elected to its office of chairman.
The Trustees, at a special meeting on 10 June, confirmed the appointment of Marcus Clarke (1846-81)—the author of *For the Term of his Natural Life*—to the position of Clerk to the Trustees and its Committees. This position's designation was later changed to Secretary.

J. C. Newbery was appointed Scientific Superintendent of the Industrial and Technological Museum of Victoria on 25 June.

The Industrial and Technological Museum of Victoria was officially opened to the public on Thursday evening, 8 September 1870.

1871 The Committee of the Industrial and Technological Museum was entrusted with the proper representation of the products and manufactures of the colony of Victoria at each of the Annual International Exhibitions to be held in London from 1872 to 1880.

1872 Victoria's products to be shown at the London International Exhibition of 1873 were displayed at the Industrial and Technological Museum from 6 November 1872 to 18 January 1873.

1874 The Hon. Edward Langton was appointed a Trustee of the Public Library, Museums, and National Gallery of Victoria on 11 May.

1875 The exhibits to be sent to the Philadelphia Centennial Exhibition of 1876 were displayed in the Great Hall, the Rotunda, the north and south courtyards and the La Trobe Street Wing from 2 September to 16 November.

The new buildings erected at the back of the Library for this exhibition were handed over to the Trustees after it closed. These buildings were re-organised into a lecture room to seat 350 people, a chemical laboratory, a metallurgical laboratory, a class room and offices.

1877 The Hon. C. H. Pearson, a Trustee of the Institution, was appointed a Royal Commissioner, on 25 June, to report on the state of public education—including technical education—in Victoria.

1880 The first International Exhibition to be held in Victoria opened on 1 October, and closed on 30 April 1881. J. C. Newbery was Honorary Superintendent of Juries and Awards at this Exhibition in Carlton Gardens.

The Hon. Sir Redmond Barry, President of the Trustees of the Institution, died on 23 November in Melbourne.

1889 A Royal Commission was appointed on 15 July to inquire into the best means of developing and promoting Victoria's coal industry. J. C. Newbery gave evidence before this commission. The Commissioners recommended that an expert be sent to other countries, to ascertain the best methods for manufacturing briquettes. The expert selected was J. C. Newbery.

1890 The tender of F. Lockington for the erection of the new Industrial and Technological Museum building was accepted in April. The building's erection necessitated the removal of the laboratory, lecture hall and offices connected with the Museum.

1891 The population of Victoria for which the Industrial and Technological Museum had to provide in 1891 was shown to be 1,140,405 by the census of 5 April. J. C. Newbery sailed from Melbourne on 17 June to investigate the brown-coal industry in Germany. The Mineralogist, O. R. Rule (1835-1926), was appointed Acting Director of the Museum during Newbery's absence.

1892 J. C. Newbery arrived back in Melbourne on 25 February. His *Report on the*

Brown Coal Industry in Germany was published by Victoria's Department of Mines in 1892.

O. R. Rule resigned as Mineralogist in April.

1893 R. H. Walcott commenced duty as Mineralogist of the Museum on 5 January.

In newly built premises the Industrial and Technological Museum, and the picture galleries on the north and west of it, were opened to the public, but without any formal ceremony, on 11 March.

At Trustees' meetings on 22 June and 27 July, it was decided that the art galleries should be named as follows: The new north picture gallery to be "The La Trobe Gallery" in honour of Victoria's first governor; the west gallery to be "The Stawell Gallery" in honour of Sir William Stawell, an original Trustee; the old Picture Gallery to be "The McArthur Gallery" in honour of David Charteris McArthur, an original Trustee. The south gallery, which had been called the Grosvenor Gallery, was henceforth to be known as "The Buvelot Gallery" in honour of Louis Buvelot, a pioneer artist of Victoria, and the Art Museum under the Barry Hall was to be "The Verdon Gallery" in honour of Sir George Verdon who was the President of the Trustees of the Institution at that time.

1895 J. C. Newbery died in the position of Scientific Superintendent of the Industrial and Technological Museum on 1 May.

R. H. Walcott, the Museum's Mineralogist, was appointed Acting Curator of the Museum in addition to his duties as Mineralogist. No additional salary was involved in this "promotion" and it became effective in May.

1896 A marble bust of J. C. Newbery, by Percival Ball, was presented to the Trustees of the Institution on 27 February.

Sir George Frederick Verdon died in the office of President of the Institution on 12 September. He was succeeded on 22 October by the Hon. Edward Langton.

1899 Professor Sir Fredrick McCoy, Director of the National Museum of Victoria, died on 13 May.

The National Museum of Victoria was moved from the University to the premises hitherto occupied by the Industrial and Technological Museum. This move was completed by December 1900.

The Industrial and Technological Museum's collections were dispersed—part of them sold, part transferred to the National Museum, and the remainder stored.

1900 Professor G. H. F. Ulrich, died on 22 May. From 1870 to 1878 he had been the Curator of Mineral Collections and Lecturer in Mineralogy of the Industrial and Technological Museum.

R. H. Walcott was appointed a permanent officer of the Public Service of Victoria and Curator of the Industrial and Technological Museum and of the National Museum's Geological and Mineralogical Collection, from 14 May 1900.

1905 The Hon. E. Langton died in the office of President of the Institution on 5 October 1905. His successor was Henry Gyles Turner.

1907 Charles Walter, the Botanist of the Industrial and Technological Museum, died in Melbourne on 11 October.

1908 R. L. J. Ellery died on 4 January. He had been a Trustee since 29 December 1881; and from 19 April 1882 till his death, Chairman of the Committee of the Industrial and Technological Museum.

The remnants of the old Great Hall and the Rotunda built for the Intercolonial Exhibition of 1866-67 and later occupied by the Industrial and Technological Museum, were demolished.

1910 The Hon. George Swinburne appointed a Trustee of the Institution on 6 July.

1912 Colonel John Monash elected President of the Victorian Institute of Engineers on 17 April. In this office he later began a movement among scientific bodies to have the Industrial and Technological Museum re-opened.

1913 The Industrial and Technological Museum was granted the Queen's Hall.

1915 The Industrial and Technological Museum of Victoria was officially re-opened in the Queen's Hall on Monday, 17 May, under the directorship of R. H. Walcott.

1919 Because of the influenza epidemic, the Industrial and Technological Museum and other branches of the Institution were closed, at the request of the government, from 29 January to 4 March.

1920 H. G. Turner died in the office of President of the Institution on 30 November, Dr A. Leeper being elected to succeed him.

1928 The Hon. G. Swinburne, M.L.C., died suddenly in the office of President of the Trustees of the Institution on 4 September.

1931 General Sir John Monash died at Toorak in Victoria on 8 October.

1932 W. D. Wilson, the Botanical Assistant at the Industrial and Technological Museum died on 1 April.

1935 On 30 September, the Director of the Industrial and Technological Museum, R. H. Walcott, retired.

L. R. Ninnis was promoted to the position of Director on 4 December.

1936 L. R. Ninnis resigned as Director on 7 January 1936.

E. H. Penrose was appointed Director on 11 February.

R. H. Fowler was appointed Assistant (Botanical) on 23 May.

1937 The first important "revolt" against the single-trust system of administration was made by the Director of the National Gallery of Victoria, J. S. MacDonald, who set out the administrative disadvantages of the system in a highly critical memorandum, dated 21 June 1937, to the Chief Secretary.

1939 The iron fence and gates on the Swanston Street frontage of the Institution were removed, and the two diagonal pathways to the entrance were constructed.

The War of 1939-45 began on Sunday, 3 September. This brought the development of the Industrial and Technological Museum almost to a standstill.

1942 The Trustees of the Institution appointed a special committee to draw up long-range plans for the development of the four branches of the Institution during

the next fifty years. This committee called for a report from a panel of architects which was published in booklet form in June 1943. It recommended the transfer of the National Gallery and the National Museum to new sites.

1945 On 16 March 1945, Act No. 5053—Public Library, National Gallery and Museums Act 1944, came into force. It dissolved the single trust for the four branches of the Institution; it created separate trusts for the Public Library and the National Gallery; and it created a new single trust to administer the two National Museums; and it changed the designation of the Industrial and Technological Museum of Victoria to Museum of Applied Science of Victoria. Another trust—the Building Trustees—was also appointed to control space allocations and common services in the Swanston Street building, for the four tenant institutions.

1950 Act No. 5447—Public Library, National Gallery and Museums Act 1949—came into force on 16 March 1950. This Act created separate trusts for the Museum of Applied Science and the National Museum.

1951 E. H. Penrose, Director of the Museum of Applied Science, retired on 1 January. Dr C. M. Focken was appointed Director of the Museum of Applied Science on 18 July.

1952 F. J. E. Kendall was appointed as Agricultural Scientist on 6 March.

1953 Dr C. M. Focken sailed from Melbourne on 13 May on an overseas study tour of science museums. Mr R. H. Fowler was appointed Acting Director during his absence. Dr Focken resumed duty at the Museum on 7 January 1954.

1955 At a Special Meeting of the Building Trustees on 3 May, it was decided to ask the Government to provide new premises first for the National Museum and subsequently the National Gallery. It was also agreed that the site vacated in due course by the National Museum should be occupied by the Museum of Applied Science and that the Public Library should then expand into the premises vacated by the Museum of Applied Science.

Sir Wilfrid Russell Grimwade, Chairman of the Trustees of the National Museums 1945-50, died on 2 November 1955.

1959 Sir John Cockcroft, a distinguished British scientist, delivered a lecture in the McCoy Hall, on 1 May entitled "Nuclear Power in the Future".

1961 Act No. 6688—State Library National Gallery National Museum and, Institute of Applied Science Act 1960—came into force on 23 January 1961. This Act changed the name of the Museum of Applied Science of Victoria to that of Institute of Applied Science of Victoria.

The Radiocarbon-Dating Laboratory of the Institute of Applied Science was officially opened on 9 May 1961 by the Chief Secretary, the Hon. Sir Arthur Rylah.

The new north-west wing of the Institute of Applied Science was officially opened on 22 November 1961 by the Chief Secretary, Sir Arthur Rylah.

Dr C. M. Focken, Director of the Institute of Applied Science, retired on 24 December.

1962 R. H. Fowler was appointed Director of the Institute of Applied Science of Victoria, on 20 March.

F. J. E. Kendall was appointed Assistant Director on 6 July.

L. F. Costermans, a teacher on loan from the Department of Education, commenced duty at the Institute of Applied Science on 26 March 1962, to institute a new Education Service.

1965 The H. V. McKay Melbourne Planetarium was officially named and opened on 2 December by the Chief Secretary, Sir Arthur Rylah.

1967 The Assistant Director, F. J. E. Kendall, set out from Melbourne by air on 24 May on an official study tour of science museums in Europe, Great Britain and the U.S.A. He arrived back in Melbourne on 2 August.

1968 O. E. Nilsson, a past Chairman of the Trustees of the Institute of Applied Science, died on 29 June.

1968 F. J. E. Kendall, Assistant Director, accepted an invitation from the International Council of Museums to attend a symposium on Museum Architecture in December 1968 at Mexico City. The visit lasted from 2 December to 23 December.

1969 Miss A. Bermingham, Chemist, left Melbourne on 5 April on an overseas tour to investigate developments in equipment and methods as a preliminary to adding the new facilities required for a research project, subsidised by the Australian Research Grants Committee, in the Radiocarbon-Dating Laboratory. She returned on 30 July.

1970 Colonel Sir Fred Garner Thorpe, a past Chairman of the Trustees of the Museum of Applied Science and of the Institute of Applied Science, died on 29 March.

The celebrations of the Institute of Applied Science, to commemorate the centenary of its opening on 8 September 1870, began on 7 April 1970. They were opened by the Chief Secretary, Sir Arthur Rylah.

On 8 April Her Majesty Queen Elizabeth II and His Royal Highness the Prince Philip, Duke of Edinburgh, accompanied by their Royal Highnesses Charles, Prince of Wales and Princess Anne, visited the Institute of Applied Science.

His Honour Judge A. L. Read, a past Chairman of the Trustees of the Institute of Applied Science, died on 23 August.

On 9 September an exhibition featuring a rock brought back from the moon by the Apollo 11 astronauts, was opened by Professor J. F. Lovering.

The Centenary Dinner of the Institute of Applied Science of Victoria was held in the Buvelot Hall, on Friday evening 11 September, in the presence of His Excellency the Governor of Victoria, Major-General Sir Rohan Delacombe.

The Radiocarbon-Dating Laboratory closed on 31 December.

Act No. 8070—The Science Museum of Victoria Act 1970—was assented to on 23 December 1970. It came into force on 3 February 1971, when the name "Institute of Applied Science of Victoria" was changed to "Science Museum of Victoria".

(B) CHAIRMEN OF THE TRUSTEES, 1950-70

1950	Colonel Fred Garner Thorpe, M.C., E.D.
1950-51	Colonel Fred Garner Thorpe, M.C., E.D.
1951-52	Colonel Sir Fred Garner Thorpe, M.C., E.D.
1952-53	Colonel Sir Fred Garner Thorpe, M.C., E.D.
1953-54	Colonel Sir Fred Garner Thorpe, M.C., E.D.
1954-55	Walter Eric Bassett, M.C.
1955-56	Walter Eric Bassett, M.C.
1956-57	Walter Eric Bassett, M.C.
1957-58	Oliver Emanuel Nilsson
1958-59	Laurence John Hartnett, C.B.E.
1959-60	Laurence John Hartnett, C.B.E.
1960-61	Frank Morres Read*
1961-62	Frank Morres Read
1962-63	Emeritus Professor Sir Leslie Martin, C.B.E.
1963	Emeritus Professor Sir Leslie Martin, C.B.E.
1963-64	Colonel Sir Fred Garner Thorpe, M.C., E.D.
1964-65	Colonel Sir Fred Garner Thorpe, M.C., E.D.
1965-66	His Honour Judge Albert Leonard Read, C.B.E.
1966-67	His Honour Judge Albert Leonard Read, C.B.E.
1967-68	Frank Morres Read, I.S.O.
1968-69	Frank Morres Read, I.S.O.
1969-70	Dr James Adam Louis Matheson, M.B.E.†
1970-71	Dr James Adam Louis Matheson, M.B.E.

(C) THE SCIENCE MUSEUM OF VICTORIA

opened in 1870 as

THE INDUSTRIAL AND TECHNOLOGICAL MUSEUM OF VICTORIA

The title was changed in 1945 to

THE MUSEUM OF APPLIED SCIENCE OF VICTORIA

and from 1961 to 1971 it was

THE INSTITUTE OF APPLIED SCIENCE OF VICTORIA

Chief Executive Officers

1870-1895	James Cosmo Newbery, C.M.G., B.Sc.(Harvard)‡
1895-1935	Richard Henry Walcott, F.G.S.**

* Mr Read was the last Chairman of the Trustees of the Museum of Applied Science and the first Chairman of the Trustees of the Institute of Applied Science.

† Dr Matheson was the last Chairman of the Trustees of the Institute of Applied Science and the first President of the Council of the Science Museum of Victoria.

‡ Official designation was "Scientific Superintendent".

** Official designation was "Curator".

1935-1936	Leonard Royce Ninnis, B.C.E.(Melb.), B.E.E.(Melb.)*
1936-1951	Edgar Howard Penrose, C.E.†
1951-1961	Charles Melbourne Focken, B.Sc.(Melb.), B.M.E.(Melb.), D.Phil.(Oxon.), M.S.(Colorado), F.Inst.P.(London), F.R.S.A.
1962-	Richard Hindle Fowler, M.Agr.Sc.(Melb.), M.A.I.A.S., F.R.S.A.

(D) COUNCIL AND STAFF
as at the commencement of the
Science Museum of Victoria Act 1970

Council

1. Previously Trustees of the Institute of Applied Science, and reappointed.

President	J. A. L. Matheson, M.B.E., Ph.D., D.Sc.(Hon.), M.C.E., F.I.C.E., F.I.Struct.E., F.I.E.Aust.
Deputy President	D. R. Zeidler, M.Sc., F.R.A.C.I., M.I.Chem.E., F.A.I.M.
Treasurer	His Honour Judge R. J. Leckie, B.A., LL.B.
Members	Sir Laurence J. Hartnett, C.B.E., F.I.E.Aust., F.R.S.A.
	P. G. Law, C.B.E., M.Sc., D.App.Sc., F.A.I.P.
	F. M. Read, I.S.O., M.Agr.Sc., F.A.I.A.S., F.R.I.P.A.
	J. M. Turner, M.B.E., E.D.

2. Additional appointees bringing the Council to full membership as provided under the Act.

A. H. Chamberlain, M.I.Ag.E.(U.K.), S.A.E.(U.S.A.)
(Replacing Sir Laurence Hartnett, retired)
I. M. Hall, B.Sc., B.Ed.
E. J. T. Tippett, M.I.B.F.(Aust.)

Staff

Director	R. H. Fowler, M.Agr.Sc., M.A.I.A.S., F.R.S.A.
Deputy Director	F. J. E. Kendall, B.Agr.Sc., M.A.I.A.S., F.R.S.A.
Chemist	Anne Bermingham, B.Sc., A.R.A.C.I.
Physicist	J. C. Liddy, B.Sc.
Lecturer	D. F. Marshall, B.Sc., T.P.T.C.
Agricultural Scientist	G. S. W. Bradbury, B.Agr.Sc., M.A.I.A.S.
Industrial Science Officer	C. V. Finlay, G.I.Mech.E.
	D. Turner, Dip.Radio Eng.
Display Officer	A. Coor, Dip.Art.(Ind.Des.)
Artist and Display Assistant	S. R. Karp, Dip.Illust.Art
	Z. M. Rubes
	Helen F. Dean, Dip.Advert.Art

* Official designation was "Curator".
† Official designation was changed from "Curator" to "Director".

Photographer	C. F. Tilson
Technician	M. E. Hancock
Technician Assistant	C. F. Smith, F.G.A.A.
Administrative	N. R. Buckley
General Assistant	B. J. Norman
Assistant (Planetarium)	Mrs Hilda Williams
Typist	Mrs Lorraine Gaylor

Officers Seconded by Education Department

Education Officers	Mrs D. G. Egan, T.P.T.C.
	K. J. Maguire, T.P.T.C.
	A. L. Nilsson, T.P.T.C., Cert. of Art
	W. F. Russell, T.P.T.C.
	P. A. Stokes, T.P.T.C.
	G. T. Warren, B.Sc., T.P.T.C.
Education Officer (Astronomy)	A. R. Cavill

Honorary Officers of the Staff

Honorary Curator of Arms	Major E. J. Millett, R.L., A.M.Inst.T.
Honorary Curator of Astronomy	W. G. H. Tregear, Dip.C.E., M.I.E.Aust., F.R.A.S., F.B.I.S.
Honorary Curator of Horology	J. Lowy
Honorary Curator of Shipping (Sail)	R. Serle
Honorary Curator of Shipping (Steam and Motor)	Lieut.-Cdr. C. E. Daw, V.R.D., R.A.N.R. (Ret.)

Members of Advisory Committees, etc.

Railways Committee	N. A. Cave
	C. R. Hansford, A.M.T.C.
	A. M. Hughes
Planetarium Committee	R. W. A. Dickson, LL.B., F.R.S.A. (Chairman)
	Cr. E. W. Best, F.A.I.
	J. C. Cook, F.A.I.M.
	Sir Laurence Hartnett, C.B.E., F.I.E.Aust., F.R.S.A.
	W. H. Lempriere, O.B.E.
	J. Lowy

Honorary Demonstrators in Astronomy

B. S. Adcock
C. W. Alexander
E. Y. Barnes, A.A.S.A., A.F.A.I.M.
Dr L. M. M. Beadnell, M.R.C.S., L.R.C.P., F.R.G.S.
C. Bezzi

R. J. Blakie
E. H. Bond
R. Brayson
P. T. Brown
G. J. Bye
A. R. Cavill
S. D. Chivers, B.Sc.
B. A. J. Clark, M.App.Sc., B.Sc. Dip.Mech.E., F.R.A.S.
A. E. Coombs, B.Sc., Dip.Ed.
A. Dorman
G. A. Duncan
J. P. D. G. Eisink, F.R.A.S.
L. G. Foster
K. G. Fowler
N. J. Hargrave, B.Sc., Grad.A.I.P., F.R.A.S.
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R. J. C. Lawrence
A. Le Marquand, A.R.M.T.C.
D. J. Linforth, B.Sc., Dip.Ed., A.Dip.App.Phys.
D. F. Marshall, B.Sc., T.P.T.C.
M. A. Naughton
B. Poppleton, M.Sc., F.R.A.S.
J. L. Perdrix, F.R.A.S.
J. H. Reeves, B.A.
J. B. Trainor
W. G. H. Tregear, Dip.C.E., M.I.E.Aust., F.R.A.S., F.B.I.S.
A. W. Walker
D. H. Walker, H.D.A., A.I.S.M.
R. F. Ward
L. R. Whitby, A.A.S.A., A.C.I.S.
J. H. White, A.A.S.A., A.C.I.S.
D. H. Whitehead
L. T. Whitney
H. E. Wilkinson, A.M.I.B.F., M.I.A.F., Dip.Met.
P. L. Wilmot

(E) MEMORANDUM ON THE DUTIES OF THE SCIENTIFIC SUPERINTENDENT OF THE TECHNOLOGICAL MUSEUM

Submitted by J. Cosmo Newbery[1]

The Scientific Superintendent should undertake the full control of the Museum collections and their arrangement, and the superintendence of the chemical laboratories.

He should arrange the collections on a purely technological basis, for the object of the Museum and its laboratories should be to instruct the manufacturer, agriculturalist, metallurgist and all artisans, in the relations of science to their avocations, how it is applied and how it operates.

No collections should be arranged in a purely scientific manner except so much as is required by the miner to illustrate geology and mineralogy, and these it will not be necessary to extend beyond the minerals and rocks of Victoria and the common ones of other countries.

At present everything should tend towards the instruction of those now engaged in

[1] The original copy of this document was written in James Cosmo Newbery's own handwriting but it was not dated. However, from the statements therein, it appears to be a very early submission, probably made in 1870.

technical pursuits, to teach them applied science and make them better workers, for instance, the brewer should be taught the chemistry of brewing and the wine maker that of wine making, and both will in future be able to produce a better beverage. The farmer should be taught how to test his soils and analyse manures and the ashes of the plants he grows so that he may obtain the maximum results from his farm, in fact become a better farmer. Industries which have not yet been successfully introduced would also receive attention and the would-be manufacturer, besides being fully instructed in the modus operandi, would learn whether the colony produced any of the raw materials which he required, for instance, the glass maker would be taught how to make the different varieties of glass, where the best sands for the various varieties are to be found and what special treatment these sands or other substances may require before they are used in the glasshouse, and those interested in pottery, porcelain or other manufactures which may profitably be introduced into the colony will receive similar information.

To carry out these objects all exhibits at the disposal of the Museum should be used in illustrating manufactures and processes that are or can be introduced here. Each manufacture should be perfectly illustrated, having every substance that enters into them exhibited in its raw and prepared state in connection with the machinery with which it is used. When practicable full sized machinery should be exhibited. If models are used they should be made on a scale and of the substances used in the actual machinery, and must be carried out to the most minute detail and every new improvement and useful invention added from time to time to make the museum of the highest value to the manufacturer, metallurgist, agriculturalist and miner.

It would be necessary to have a laboratory attached in which instructions should be given in so much of practical chemistry, whether organic or inorganic, as may be required in these pursuits.

Instruction should be given verbally by the teachers in the laboratory to each pupil separately, on the work he has in hand, besides class lectures which would be given to the whole of the pupils in the class room.

An exact syllabus of these class lectures can hardly be given as they will in a great measure depend on the requirements of the pupils. They would probably comprise short courses on elementary physics, and elementary chemistry, both organic and inorganic—and such special courses on agricultural chemistry, metallurgy, etc. as may be decided on. This would not interfere with lectures or instruction given by other persons on mineralogy, geology, mining, botany, etc., nor with popular lectures which it may be desirable to give.

(F) A PAGE FROM THE CATALOGUE OF THE INDUSTRIAL AND TECHNOLOGICAL MUSEUM OF VICTORIA FOR 1873

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Scientific Superintendent & Lecturer in Practical Chemisty J. Cosmo Newbery, B. Sc.
Lecturer in Mineralogy and Mining - - - - - G. H. F. Ulrich, M.E., F.G.S.
Lecturer in Mathematics, Practical Geometry, & Mechanics F. J. Pirani, M.A., C.E.
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Practical Chemistry.—Analytical, Agricultural, and Manufacturing Chemistry, Metallurgy, and Assaying. Instruction given daily (Saturdays excepted). Hours 10 a.m. to 3 p.m. Fees, £4 a quarter.

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Mineralogy.—Practical Mineralogy and the Use of the Blowpipe in the Detection and Assay of Ores. A course of 24 Lectures, with practical Instruction in Laboratory, Monday and Tuesday. Hours, 4.30 p.m. to 6 p.m. Fees, £2 the course.

SCHOOL OF MATHEMATICS AND PRACTICAL GEOMETRY.

Mathematics.—Course of 3 Terms, of 24 Lectures each. Two lectures a week, Monday and Thursday. Hours, 7.30 p.m. to 9.30 p.m. Fees, 15s. for each term.

Practical Geometry.—Course of 3 terms, of 24 Lectures each. Two lectures a week, Monday and Thursday. Hours, 7.30 p.m. to 9.30 p.m. Fees, 15s. for each term.

[*These two Courses may be taken together.* Fee, £1.]

SCHOOL OF TELEGRAPHY.

[*Students attending these Classes must be proficient in* Writing *and* Spelling.]

Practice of Telegraphy.—Instruction in Practical Telegraphy, and use of Telegraphic Instrument. Course of Lectures on Management of Batteries, Circuits, and Ordinary Line and Battery Testing.

Theory of Telegraphy.—Principles of Electricity and Galvanism. Course of Lectures on the properties of Static and Dynamic Electricity, Magnetism and Electro-Magnetism, Conduction, Resistance, Induction, and Batteries. Each course will occupy at least two terms. Lectures, Tuesday and Friday. Hours, 7 p.m. to 9 p.m. Fees, £1 for each term. Examinations will be held at the end of each Course, and certificates of competence given.

(G) L. R. EAST TO R. H. FOWLER 11 AUGUST 1953

State Rivers and Water Supply Commission

100-110 Exhibition Street,
Melbourne, C.1
11th August, 1953

53/13979

Dear Mr. Fowler,

When I was overseas last year, I was impressed by the way in which the Americans and the British treasured almost as "National Memorials" locomotives and engines of historic interest.

In many of the places I visited, I found preserved the earliest—or at least one of the earliest—steam locomotives which had operated in the district, and in some places old pumping engines, long out of action, are being preserved for posterity.

In England, apart from the famous South Kensington Science Museum, ancient locomotives are centres of local pride and very great interest in many places. At York, there is a shed with about a dozen full size original locomotives ranging from about 1829 or earlier to about 1908. At Darlington, there are the original locomotive No. 1—the first locomotive on a public railway—and the Derwent. At Canterbury, there is Invicta, and there are many others.

In Australia, Sydney has in its Technology Museum, New South Wales' first locomotive built by Robert Stephenson. Brisbane, in the Pavilion, preserves what is probably its first locomotive. In the Power House at Kalgoorlie, Western Australia, there is an amazing sequence of prime movers kept in perfect condition, but in Victoria, as far as I can ascertain, no full size machinery of any kind is being preserved for posterity by any organization or any person.

I suggest that your Trustees might cause an investigation to be made with a view to ascertaining what old mechanical plant of historic interest still remains in Victoria, with a view to considering where and how it can be preserved and made accessible to the public.

This investigation could be followed by the development of a policy for the preservation of typical machinery of the present day, for it too will become obsolete and be scrapped in the course of time without leaving any examples unless something is done to ensure that samples will be kept for the future.

What has led me to write to you at the present time is the fact that my Commission has just scrapped an engine originally installed 50 years ago. It is a type that will never be installed again, and we would have liked to have seen the engine retained in some way as a museum piece. The engine would be useless as a museum piece in its present location some 30 miles from Swan Hill, and the cost of shifting it and re-assembling the pieces, even on dummy foundations would probably be greater than warranted in this particular case. I enclose an extract from my Commission's journal describing the engine under the heading "Cannie Ridge Pump".

Although this engine may not be worth preserving, I am sure that there are other

engines, locomotives and electrical equipment which it would certainly be a tragedy to allow to be scrapped.

I hope that your Trustees will be able to do something about this matter.

Yours sincerely,

L. R. East
CHAIRMAN

R. H. Fowler, Esq.,
Acting Director, Museum of Applied Science of Victoria,
Swanston Street, Melbourne, C.1.

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